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SOAP and SANITARY CHEMICALS

CONTENTS

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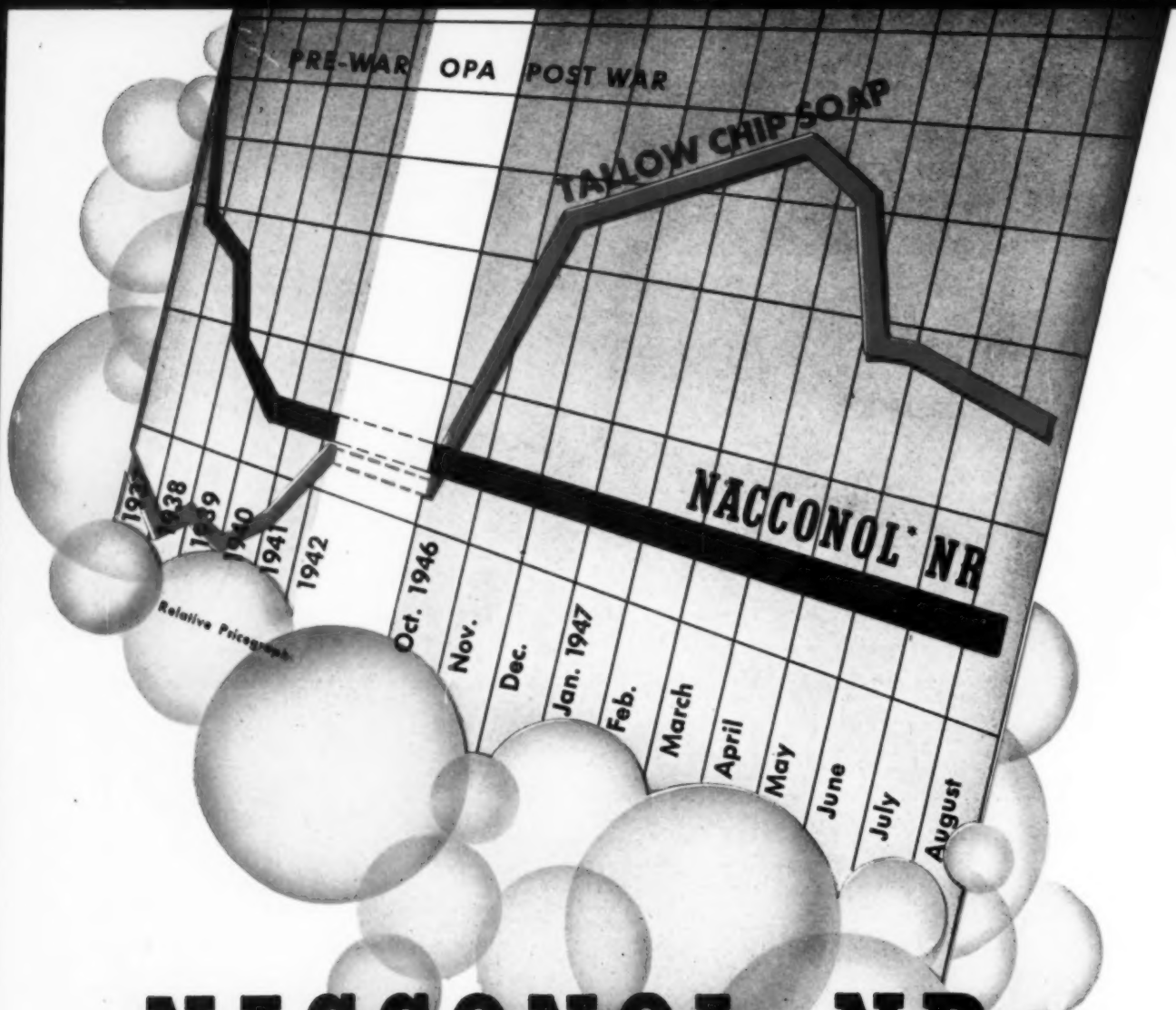

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AS THE EDITOR SEES IT

AS far as the soap industry is concerned, we fear that the honeymoon has quite definitely ended. Back in May and June when the soap market became somewhat jittery and shaky, we felt that the days of bliss were already numbered. Today, the old spirit of pre-war competition is back. Soap buyers make no bones about whetting their knives openly. Some throats have already been cut. Others will be slit as their owners file slowly through the purchasing departments of this and that merchandising organization.

That we have switched over rather completely from a sellers' to a buyers' market is everywhere evident. Downtrodden soap buyers have arisen from the dust, once again conscious of their power. Salesmen have resumed the old custom of removing their hats upon entering the buyer's presence. The smoldering resentment of the past five years among the purchasing fraternity is cropping out in the form of plain, ordinary garden-variety revenge. The fellow who did our little Nell dirt during the war is out. And somebody else is in.

In the case of private brand and bulk soaps, and in soap specialties, there seems to have been a lot of switching around in sources of supply. As noted, buyers who feel that they were ill-treated,—and what buyer didn't?—during the days of the great soap scarcity, are placing their business elsewhere. This has brought what appears to be a sort of wholesale criss-crossing of soap accounts. If it keeps up, many soapers will end up with a whole new set of customers. That this might be the aftermath of much ill-feeling engendered during the quota period is probably no surprise to anyone.

In spite of a lot of switching around in soap accounts, one significant demand among buyers appears to stand out uniformly. They insist upon quality. Quality consciousness seems to be keener and more pronounced than it ever was, even in pre-war days. That buyers are insisting upon high quality and getting it,—not only in toilet soaps but in other types as well,—has apparently directly affected the market for some lower grades of soap fats to the point that they are going begging. And with it all, the competition for business has become increasingly keen and a greater willingness to shade prices is reported.

Hence, after discussing the situation with both soap buyers and soap makers, we reluctantly conclude as mentioned before that the honeymoon is over. That "return to normal" which we all chatted about so glibly a year ago seems to have arrived on the scene with a bang. From now on, we have a hunch, making the grade in the soap business will not be as easy as it has been over the past five or six years.

AT a recent meeting in Washington of representatives of the oil, fat and soap industries with officials of the Production and Marketing Administration of USDA, expressed opinions on production and consumption, on supplies and scarcities, were as diverse as the four winds. These experts who only last January were almost unanimous in their belief that fats and oils would continue acutely scarce through this year and next, now seem to have changed their minds. Ample supplies for the balance of this year appear in good prospect, they agreed,—and if,—the big "if,"—our balance of fat exports does not show too great a margin over imports next year, we may get by.

Not too much imagination is needed to perceive that if fat and oil exports become large enough next year, they could conceivably just about drain this market dry. We feel that the IEFC and our State Department, using our fat supply as one pawn in its international political chess game,—shipping oils to South America for example,—could maneuver us into such a spot in spite of the availability of ample supplies under normal conditions.

Little wonder exists that there is disgust and disagreement among fat and oil producers and consumers, and that the outstanding characteristic of the oil and fat markets is uncertainty. As long as politicians pull the strings, there can be nothing else. Until the market is rid of their influence under one guise or another, the experts might just as well go on a long vacation and take their statistics with them.

NOT all soapers feel that a lower level of copra prices in the Philippines will interfere too much with shipments and coconut oil production. Some maintain that so large a segment of the Philippine population depends upon copra for a livelihood that they must continue to produce and ship in order to live,—and that the price at which copra sells determines how well or how poorly they live. Naturally, when the price of copra was sky-high, every pound possible was rushed to market to take advantage of the price. But whether a so-called "normal" price will continue to bring out large supplies remains to be seen.

COMPARATIVELY little discussion of the Taft-Hartley Law has been heard in and around the soap industry. Probably because labor problems are in reality few compared to other major industries. Over the past decade during which labor disputes and strikes reached an all-time high, the number of such disputes in soap plants was extremely small. Nevertheless, the new law does apply to soapers as well as to all other industry and as such warrants brief comment.

That the Taft-Hartley Act is anti-labor and an insidious plan to "enslave" labor is the tag applied by labor organizers,—and if you please, labor exploiters,—who resent the curtailment of their unbridled power over industry, labor, and, probably most important of all, union funds which the Wagner Act gave them. Every employer knows that the worker will not suffer one whit under the act. But the union czars who have treated the workers as their personal chattels have unquestionably had their wings clipped. That the law equalizes a previously very lop-sided situation is quite evident. That it passed Congress as a result of strong public sentiment is also evident. Given a fair chance to operate for a few years, we feel, that in the long run it will be quite evident that the worker will be the greatest beneficiary.

MORE glamour in toilet soap sales! In spite of the roasting which national toilet soap advertising has taken over the years, an old-time soap company executive told us in a confidential whisper recently that this fantastic glamour advertising copy has done more in recent years to stimulate the sale of toilet soaps than all other selling put together. Although he admitted that he blushed privately when he first read the soap advertisements which proved conclusively that no female need ever hope to be kissed passionately on the neck by a big wavy-haired adonis if said neck had not been beautified to snowy loveliness via a good scrubbing with the soft creamy lather of Googoo Toilet Soap. Or that any girl might ever hope to become a bride if she failed to bathe with Googoo or wash her pants in its chip soap counterpart.

Shocked and ashamed when this glamour advertising first smote him in the eye, this old-timer,—incidentally not associated with any of the big fellows,—is now a changed and hardened man. He is all for shoveling it on thicker and thicker. Glamour sells toilet soap to more and more people. In holding out the hope of attaining loveliness, it induces more people to take more baths. Whether they may or may not believe that they will attain their hopes is beside the point. They no longer offend those with sensitive nostrils. They are easier to live with. Not to mention again that they buy and use a lot more soap. So on with the glamour! Let the critics rave!

Preparing Soap Samples with the Laboratory Press

By Samuel Klein, Ph. C.

Synfleur Scientific Laboratories, Inc.
Monticello, N. Y.

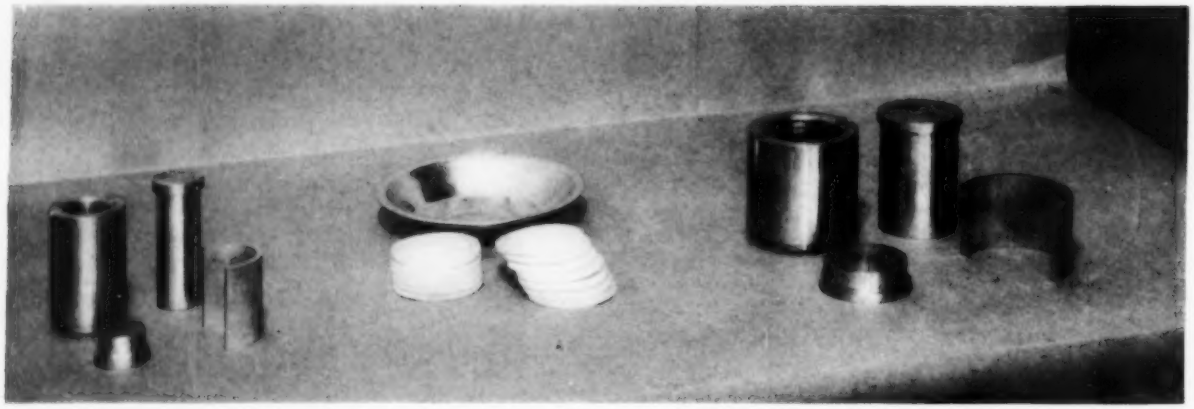
AN economical time-saving device for the preparation of uniform experimental soap admixtures in sample cake form is the laboratory press.* This method is of special value whenever a wide variety of formulations or percentage admixtures are to be incorporated into a soap base.

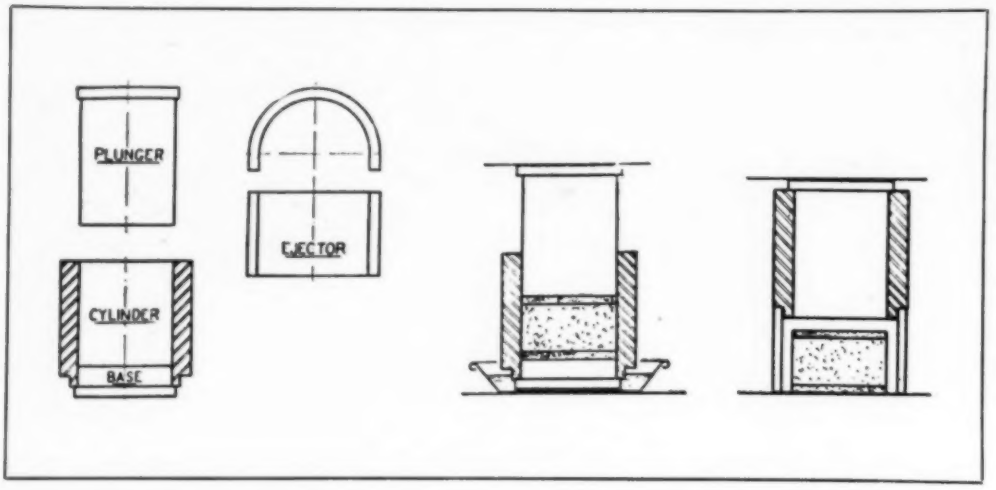
Such a method does not conflict with the pilot plant setup in general use in soap works laboratories; it does, in fact, complement it. It is intended for those occasions requiring a certain amount of preliminary research before making ready for pilot plant operation. For instance, it may be necessary to determine the effect of the addition to a soap base of a large variety of different percentages of material. These may include colors, antioxidants, and aromatics.

In this work, an often-used method is simply to chip and grind the milled soap in a household mincing machine or meat chopper. The special ingredient is then added to the soap and the mixture is rubbed to uniformity in a wedgewood mortar. It is then removed and hand formed into a rough round mass. This method for various reasons is unsuitable for accurate scientific work. It results in admixture of hand sweat, organic acids and mixed salts in varying percentage, liability to contamination with previously used materials and difficulty in quick, thorough cleansing of the porous wedgewood mortar. Then too, there occurs a lack of uniformity in size, shape, weight, surface and compression of resulting product.

The simple method here described is designed to overcome these objections. The described test cylinder and laboratory press are the principal items of equipment used. So far as is

* The laboratory press and test cylinder manufactured by Fred S. Carver Co., New York, is used and described in the method here presented.





Above: Two sizes of test cylinders with plungers, base and ejector pieces. Shown in center are filter pads and oil collecting dish.

At left: The assembly drawing shows how the plunger is used first to press the cake and then to eject it from the cylinder.

known, this research equipment, though widely used in the allied fats and oils, and wax industries, is not in general use in the soap industry.

If bar soap is used, it is first passed through a household mincing machine. In our experiments a heavily tinned Universal meat chopper, No. 323, made by Landers, Frary & Charr, New Britain, Conn., was used. The ground soap is received in a fine wire mesh strainer and shaken into a dish. Pieces too large to pass the strainer are put through with the next batch of bar soap.

The required weight of soap is transferred to a clean glazed porcelain evaporating dish. For this purpose a heavy stainless steel tablespoon serves nicely. If the material to be incorporated is granular or crystalline, it is first rubbed to a fine powder, using a stainless steel spatula on a tile. If the material is liquid, it should be delivered with a fine bore pipette, warmed if necessary. The object, of course, is to facilitate smooth, even spreading of the material. Thorough admixture is easily effected by tossing and alternate pressure spreading with the tablespoon, the handle of which should be bent upward about fifteen degrees to improve leverage. The soap mass is then spooned into the Carver test cylinder, tamped down and compressed. The cylinder used in our work is 1⅛" in diameter.

For applying pressure, where no control or accuracy is needed, any hand press can serve. However, it was found that the laboratory press was desirable because of mechanical ease and simplicity, clean construction, and accurate pressure control.

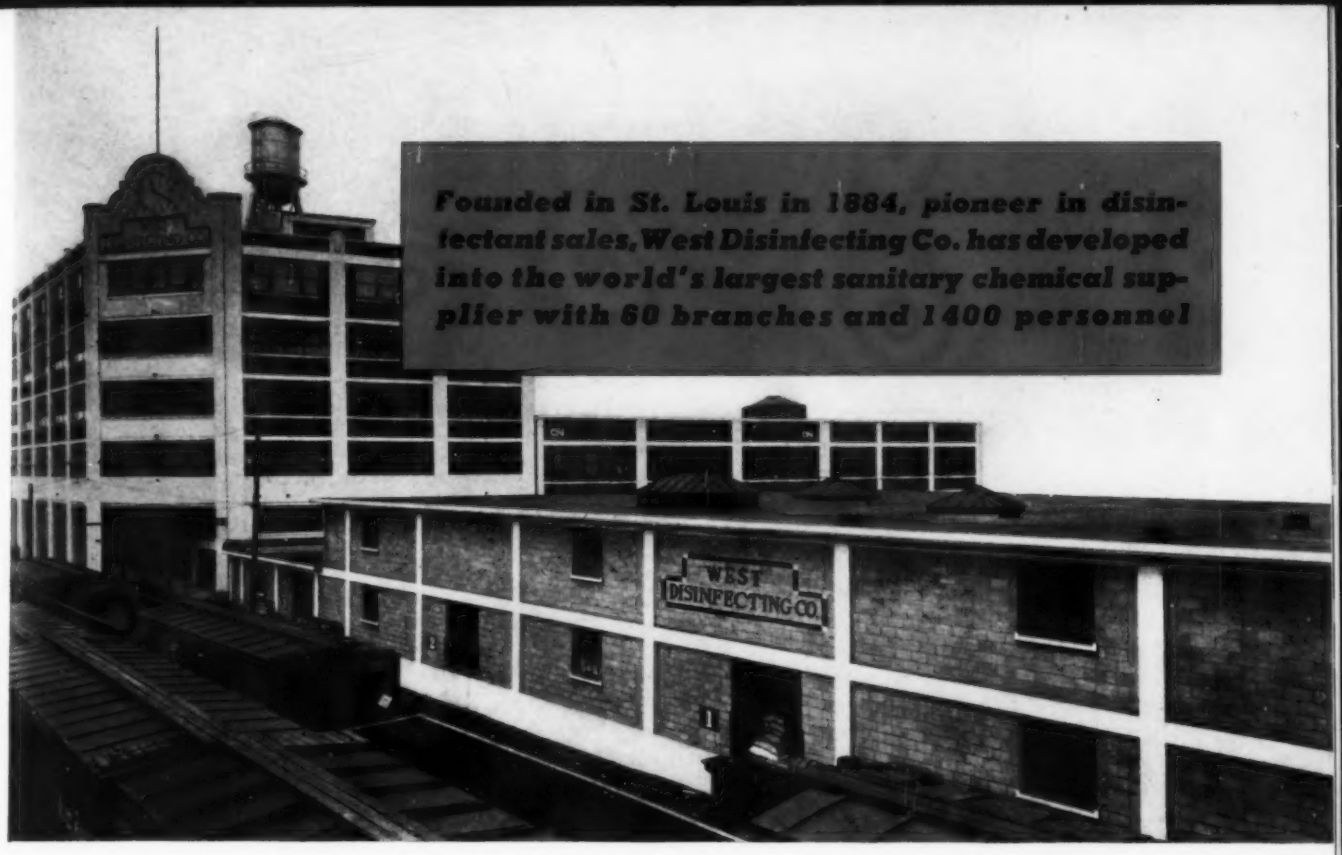
In order to demonstrate the speed and effectiveness of the described method a special series of six sample cakes was prepared:

1. Eugenol pure, 3% in soap base, 30 grams sample.
2. Blank, consisting of straight soap base, 30 grams.
3. Rhodamine-B, 10% solution, 3% in soap base, 30 grams sample.
4. Blank, consisting of straight soap base, 30 grams.
5. Diphenyl oxide, 50% in Benzyl benzoate, 3% in soap base, 30 grams sample.
6. Blank, consisting of straight soap base, 30 grams.

In all cases the blanks were free from the contaminating material of a previous batch. Cleansing was quickly accomplished with bristle brush, and hot soapy water.

Total elapsed time required to weigh, admix, transfer, press out and cleanse equipment was 58 minutes, or approximately ten minutes per sample. The average loss of material per 30 gram sample was 0.06 gram, or one-fifth of one per cent.

This demonstrates the desirability of the method for accurate work. It should be of especial utility in color, chemical and aromatics experiments in the soap and allied industries.



Founded in St. Louis in 1884, pioneer in disinfectant sales, West Disinfecting Co. has developed into the world's largest sanitary chemical supplier with 60 branches and 1400 personnel

WEST DISINFECTING...

WEST DISINFECTING COMPANY, the largest concern of its type in the world, is now in its 63rd year. The original company was founded in 1884 by Robert S. West, who introduced to the American public a soluble coal-tar disinfectant originated by a Dr. Knight of Cambridge University, England. This product, which was first called "Chloro Naphtholeum," was the main item around which Mr. West's business was built. He operated originally in St. Louis and shortly expanded to Cleveland and New York City. The personnel complement of ten people in those early years was a far cry from the company's present list of 1,400 employees.

The original product "Chloro Naphtholeum" was changed shortly thereafter to "Coro Noleum" due to the fact that it contained neither chlorine nor naphtha. The selection of the original name had been made arbitrarily in England and was designated solely on the basis of anticipated sales appeal.

The sales development in the early stages was made through the agency of E. Taussig & Company, whose activity increased to the point where the Taussig interests purchased the company, including its name of Robert S. West & Company, from Mr. West and instituted the present corporate name of the company. This took place in 1899, the company then making its headquarters on East 54th Street, New York City. By this time another staple, the dispensing of deodorant fluids through automatic machines, was developed and proved to be one of the outstanding contributions of the company to industrial and institutional sanitation. The company's progress for those days was exceptional, so that it was not long before a small lot was purchased in Long Island City and the first factory building of the eighteen now in existence was constructed. The company's operations had now reached a stage where it was essential to place the responsibility for its chemical manufacturing under a competent executive. Therefore, in 1901, Mr. Taussig was able, through English buying contacts, to secure the services of Dr. William Dreyfus, a graduate of the University of Zurich, Switzerland, who had been working in London in the coal-tar industry. Dr. Dreyfus, who was for many years an outstanding figure in the disinfectant field in the United States, continued in his post until the time of his death in March, 1946. There is no doubt but that much of the company's and the industry's development through the years can be traced to his influence.

In 1902, following the death of one of Mr. Taussig's financially interested associates, outside financial interests were sought. It was at this point that the Marcuse family, which is now actively directing the management of the company, entered the picture. M. M. Marcuse, who with his three brothers had recently sold their can manufacturing plant, the Hasker &

M. M. MARCUSE
Chairman of the Board

JAMES E. MARCUSE
President

JOHN A. MARCUSE
Vice-President

Marcuse Manufacturing Company, to the American Can Company, was anxious to interest himself in the development of a new industry. The brothers purchased a substantial interest in West Disinfecting Company, and M. M. Marcuse became its vice-president in January, 1903. In 1912, Emil Taussig, president of the company, visited Europe and embarked on his return on the ill-fated "Titanic." Although his wife and daughter were among those saved, he was not. His widow wished to eliminate several past associations and it was then that the Marcuse family purchased the balance of West Disinfecting Company stock and took over complete control of the company's management and policies. M. M. Marcuse became the company president. A. J. Marcuse, his brother, resigned his sales executive position with American Can Company and was elected vice-president of the West Disinfecting Company. Shortly afterward, Joseph R. Oppenheimer, who had previously come to West Disinfecting Company from the Standard Oil Company of New York, became secretary. A. J. Marcuse and J. R. Oppenheimer continued actively in their positions until their deaths in 1938.

During the pioneering stages of the company, the officers gave full attention to the development of future management personnel. Accordingly, the educational development of the younger men in the families was directed specifically to fit them for later responsibilities. James E. Marcuse, (son of M. M. Marcuse), entered the company in 1928 after having studied at Princeton University and the Harvard Business School. John Marcuse, (son of A. J. Marcuse), who is widely known to members of the sanitation products industry, was trained in the chemical field at Johns-Hopkins University. These young men, with M. M. Marcuse, now direct all phases of the company's activities, as president and vice-president. Leonard J. Oppenheimer, who studied at the University of Pennsylvania, Wharton School of Finance and Commerce, was trained in the production and purchasing departments of the company and in 1946 became secretary of the company, a position formerly held for almost 30 years by his father.

From a very small beginning, West Disinfecting grew so rapidly that it was expedient to turn over a great part of its financial and legal procedures to the guidance of one individual. For many years Alfred J. Kirsh, the company's treasurer and general counsel, has ably carried this responsibility. In fact, the company's history has shown over the years that many young men have been regularly added to its staff, and they invariably have grown old or passed on before being disassociated with its activities. S. S. Ross, the present controller, has been an employee for 18 years, having started as a clerk in the main office at Long Island City.

John A. Manley, whose efforts in the past for West Disinfecting Co. have been confined to "Lan-O-Kleen" sales, was recently appointed general sales manager, supervising all sales with the exception of those on "CN."

The company's business has expanded so widely that many of its functions of necessity have been departmentalized in the past several years. Today, purchasing, traffic, insurance, chemical manufacturing, chemical research, advertising and export departments all operate as wholly separate divisions under experienced directors.

PRIOR to 1912, in the early development of the company, its sales activities were carried on by a combination of factory-owned branches and agencies in several sections of the country. The company's own branches and salesmen developed their territories more rapidly and more thoroughly and it was then decided to eliminate the agency feature and develop future markets solely through the company's salesmen. Today, West Disinfecting has sales offices in sixty-one cities of the United States and Canada. It was only a short time ago that the Canadian development was considered sufficiently large to form a Canadian corporation under a resident director. Almost all of the materials sold in Canada are produced in the company's factory at Montreal.

During the period of World War II, small factories were started in Chicago and Los Angeles to supplement major production at Long Island

Late DR. WM. DREYFUS
Former Technical Director

L. J. OPPENHEIMER
Secretary

A. J. KIRSH
Treasurer

City. Events have so justified this procedure that the company is now in the process of building a new factory and sales office in Chicago to replace present quarters which have become inadequate for the enlarged business. Occupancy is expected in the Fall of this year and the management anticipates an accelerated development in the mid-west due to these increased facilities.

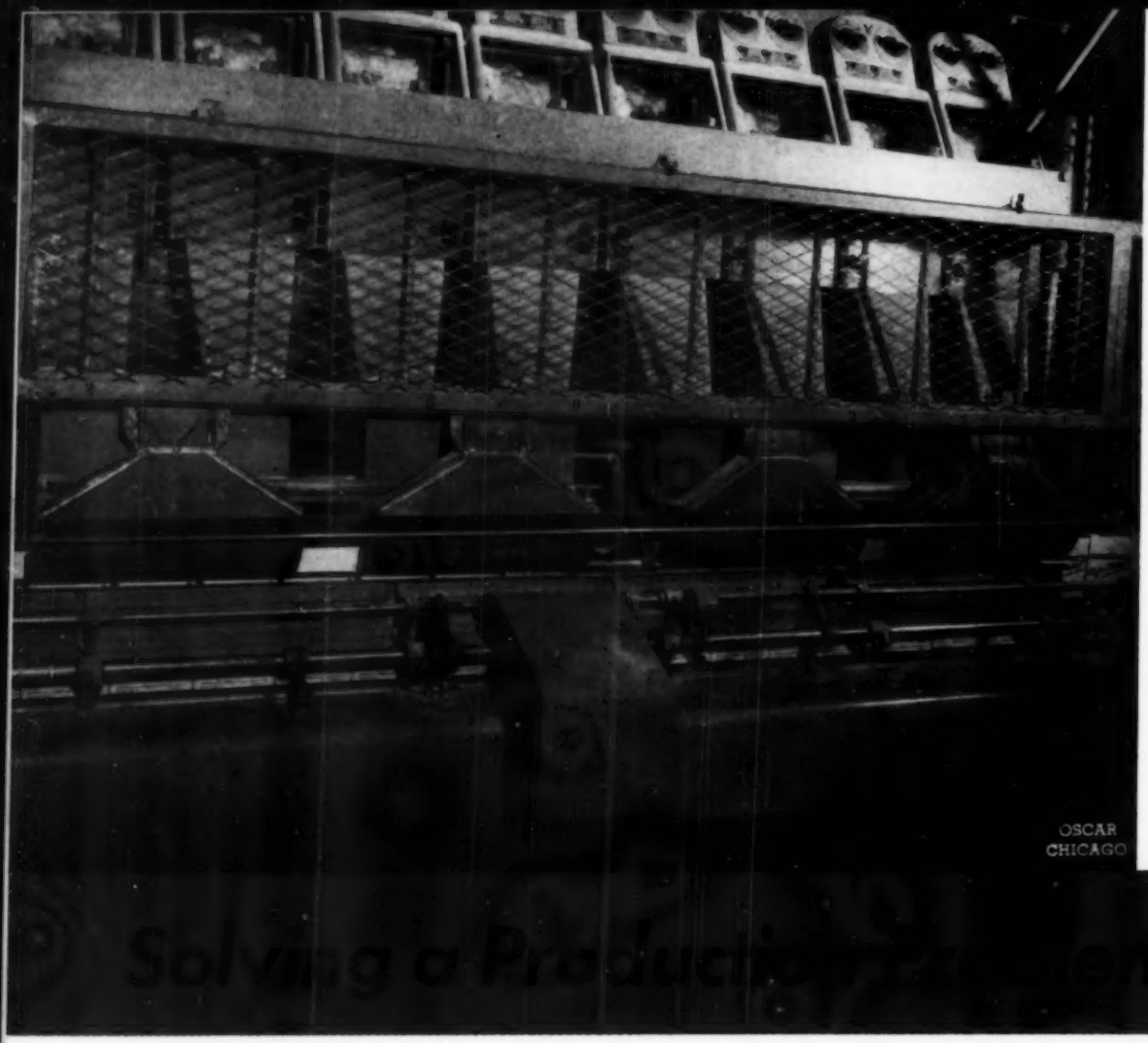
As previously mentioned, the first featured product manufactured by West was a coal-tar disinfectant. It was not long before West's activities extended to insecticides, cleaning and detergent products and the pioneering development of liquid hand soaps and paper towels. Needless to say these two groups of products have represented important milestones in the modern science of industrial maintenance. West has maintained a research laboratory through the years, and is continually adding to it. In addition to the original coal-tar disinfectant, West now produces a full line of pine disinfectants and quaternaries. This company was a leader in the development of the service type of plant sanitation. In addition to having its salesmen work from scattered offices throughout the country, each separate branch maintains its own staff of service men and inspectors who do a great part of the actual sanitation service at users' premises.

In furthering the sales and distribution of its chemical products, West developed practically all of its own mechanical items used in conjunction with its various products. Although it may not be generally realized in the industry, practically 100 per cent of these mechanical items were designed, developed and produced in the company's factory at Long Island City. Included in these are soap dispensers, valves and the latest item, an unusually effective heavy duty dispenser which handles "Lan-O-Kleen," the company's powder-type industrial hand cleaner. Since 1925 West Disinfecting has been the exclusive distributor for the sale of Kotex Sanitary Napkins vended through coin operated machines installed in ladies' restrooms.

Besides working directly with the user on most of its products, the company has developed a bottled disinfectant well known as "CN," which reaches the public through jobbers,

(*Turn to Page* 83)

West Disinfecting Company sales force as of 1905.



This close-up shows a series of light indicators serving to signal points in the filling and weighing cycle. Plungers for compressing flakes into cartons are attached to the eight shafts behind the wire cage protector. Carton distortion is prevented by the bar seen below the dust hoods. If the cage protector unhinges, the filler shuts down.

Solving a Production Problem in

WHEN a company is faced with the problem of suddenly increasing production capacity to meet with what is expected to be a heavy and continued sales volume, production and development engineers all along the line of process are usually in for a few headaches. This is especially true for those responsible for the intricate process of packaging soap flakes at large capacity production.

Production engineers at Armour & Company, Chicago, faced several months ago with the problem of stepping up packaging facilities for "Chiffon Soap Flakes" turned to one of their packaging machine suppliers, Triangle Package Machinery Co., Chicago, in order to get the answer in a hurry. Equipment manufacturers are usually the best source of help under such conditions for, when acquainted with the requirements, they know best how to modify their machines to solve such problems.

Briefly the requirements were to construct a completely automatic packaging line which would take the soap flakes from the manufacturing processes and automatically and accurately dispense them into cartons, delivering these to packaging cases. Although this probably sounds similar to any other packaging application, when packaging soap a number of problems are imposed and a few of them were:

1. The flakes could not be broken or mashed.
2. The containers had to be filled to an exacting tolerance.
3. Filling speeds were to be in excess of 75 packages per minute.
4. The flakes would normally occupy 2½ times the volume in which they were to be placed. Therefore, some sort of plunging type action had to be designed to compress them.

There is a good deal more to such a problem than conveying the material from one floor to another. One key to the accurate filling of the product is pre-conditioning. Engineers developed several methods whereby the product is fed by means of ribbon-screw conveyors in an even distribution to each of eight sections comprising the "Elec-Tri-Pak" weighing machine.

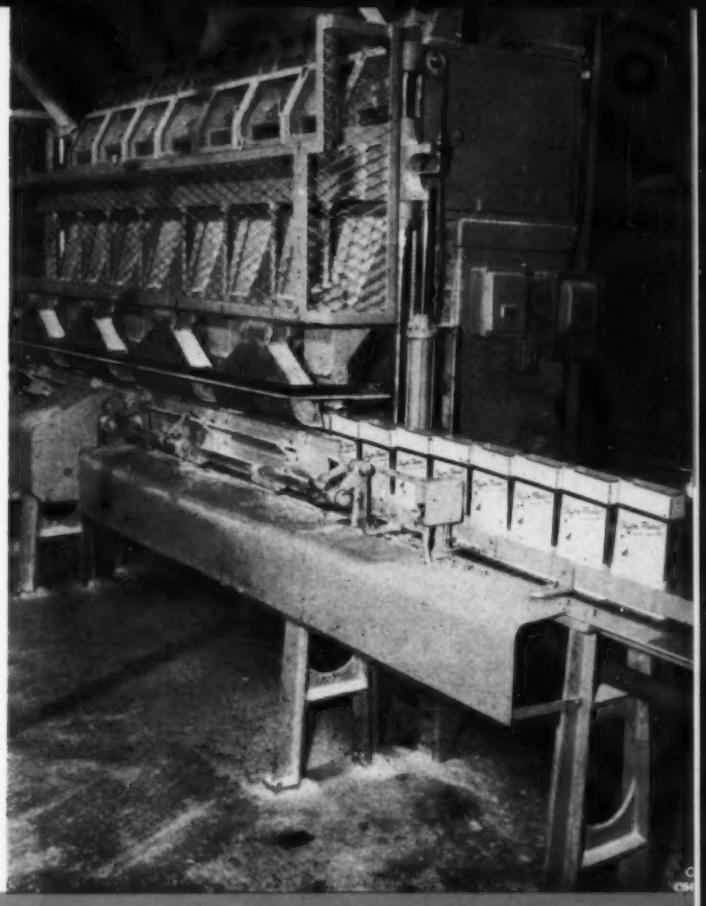
Cartons are automatically delivered to the head of the weigher where a mechanism gates them so that they are synchronously driven into the filling machine and then positioned directly under the filling point. Air activated plungers press the material in such a fashion that the flakes are not broken, and discharge the packages at the rate of seventy-five per minute.

Several safety features are incorporated in this piece of equipment: Should there be no package directly under the filling spout or spouts, the machine will not dispense its load. Should there be no packages ready to be gated into the filler, the unit will not dispense. Also, if for some reason the top-sealing mechanism should be inoperative, the filled packages will back up in the filler and cause it to shut down automatically.

Each section of the eight section scale unit is comprised of two parallel vibrating feed trays. These two trays are commonly referred to as bulk and dribble trays, and dispense approximately 80 and 20 per cent respectively of the load in any one carton. Each parallel tray of the unit works on the initial feeding. After approximately 80 per cent of the bulk load is dispensed, the bulk tray automatically shuts off, permitting the dribble tray to bring the package up to the correct tolerance.

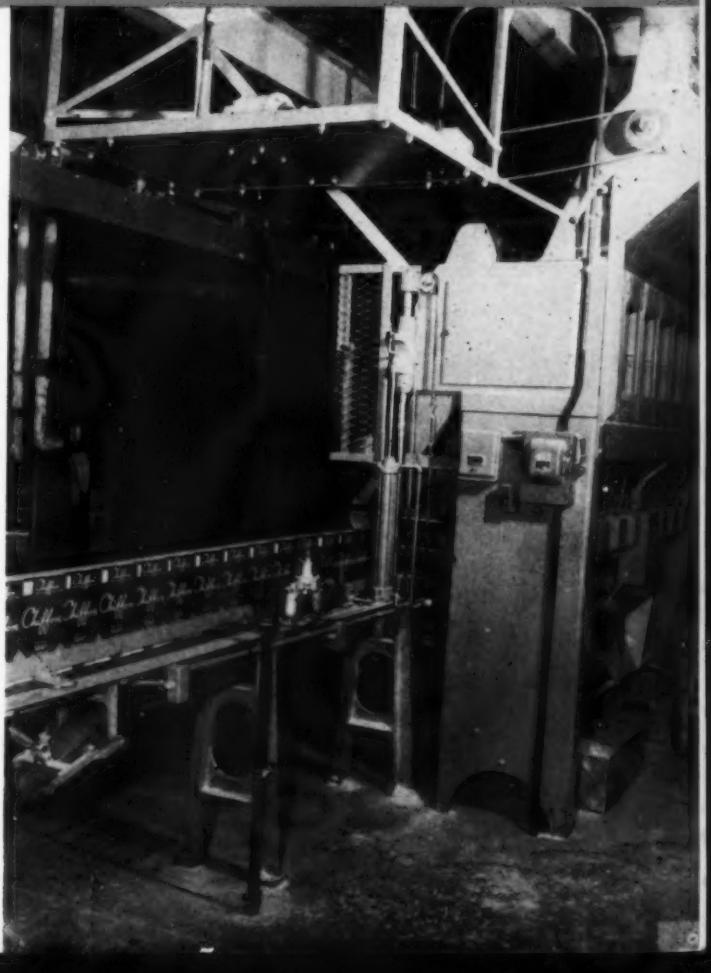
To aid operating personnel, amber, red and green light signals located on the filler indicate how the equipment is functioning. Amber and red lights serve to indicate the functioning of the bulk and dribble trays respectively. When the bulk tray filling ceases, only the red light remains on, indicating that only the dribble tray is operating. When the dribble tray has brought the package up to its proper weight, the red light goes out and a green light is on, indicating a completed cycle.

As was previously mentioned, the material is such that if it were in a non-compressed state it would occupy approximately 2½ times the volume of the container in which it is packaged. For this reason an "electro mechanical" bar exerts a pressure against each carton after it has been filled so that when an air-operated plunger uniformly and gently compresses the flakes into the carton, no distortion of the carton results.



Here the cartons are "gated in" and located under the filling spout. Note the dust hoods (four in all) surrounding the cartons for the purpose of eliminating excessive dusting which has always been an inconvenience to workers in a flakes filling room.

Automatic Soap Flake Packaging



A ribbon screw conveyor is illustrated on top of the machine. It distributes the material uniformly to the eight vibrating trays. In the foreground is an air operated cylinder which operates the eight plungers for compressing the flakes in the carton.

Synthetic Chemicals in the Textile Industry

By Paul I. Smith

MANY synthetic products, stable to acids and hard water, have been finding increasing use in the textile industry over recent years as detergents, wetting agents and emulsifiers for a large number of processes. The sulfated fatty alcohols and esters are the best known of these auxiliary chemicals. Most of them, incidentally, are sold under various trade names, and in some instances the actual chemical formulae of the compounds are not known and their production is based largely on empirical methods.

Detergents

These are the most important of the textile auxiliaries in general use in the textile processing industry today. It is not possible to carry out such processes as dyeing, printing and other finishing processes unless preliminary scouring has been carried out completely.

The first synthetic detergent was made well over a hundred years ago when Dumas and Peligot first produced the sulfuric ester of cetyl alcohol. It was not, however, until some forty years later that the soap-like properties of this synthetic were given any consideration, and then only in a non-commercial academic manner. The excellent scouring properties of sulfated cetyl alcohol and other sulfated fatty alcohols did not become fully appreciated until the early 1930's. A large number of synthetic organic compounds are now being used and recommended for textile scouring. These include aryl alkyl sulfonates, benzine sulfonates, alkenyl succinic derivatives, etc.

The main requirements of a synthetic detergent to be used as a scouring agent in the textile industry may be summarized as follows:

1. It should dissolve in warm or hot water to give a neutral solution.
2. The solution should be stable in the presence of hardness salts, metallic salts, acids (dilute) and alkalies (including lime which should not have any precipitating action on the detergent). Stability should not be affected by prolonged boiling.
3. The detergent should possess good wetting, emulsifying, levelling and penetrating properties.

The use of hard water in textile processing, particularly in scouring and washing woolen or worsted yarns, makes it highly desirable to make use of scouring agents which are unaffected by lime. The presence of sticky and insoluble calcium soaps causes considerable trouble in dyeing and finishing processes, and the use of alkalies causes the delicate wool fibres to become harsh and even discolored. For woolens and worsted the advantage of synthetic detergents may be summarized as follows:

Scouring

Use of sulfated fatty alcohols, ethers and other synthetic detergents effects the complete removal of dirt and grease and yet at the same time imparts a soft and pleasing handle to the wool. The presence of a small quantity of the detergent in the wool does not offer any danger of rancidity or objectionable odor. For cotton, the presence of a suitable synthetic detergent in the kier enables subsequent bleaching to be cut down with consequent saving of labor, speeding up of production and general improvement in quality of finished goods. In rayon manufacture, scouring may be completed without use of alkalies which often produce a deleterious effect on the fibers. Generally speaking, therefore, the use of efficient auxiliaries, possessing good detergent and wetting properties and stability, enables considerable economies to be effected in textile scouring, yet at the same time it makes possible an improvement in quality. The less energetic the scouring, boiling and bleaching, and the milder the agents used to remove dirt and oil, the higher the quality of the finished goods.

Dyeing

Use of these auxiliaries in weakly acid dye baths, as well as in dyeing operation with vat and naphthol colors where weakly alkaline conditions are present, assists penetration and levelness of shade. Generally speaking the employment of sulfated fatty alcohols in the dyebath ensures brighter and clearer shades for cotton goods. In the case of basic dyes it is not advisable to use these auxiliaries as no improvement

is effected. For woolens and worsteds, the use of synthetic detergents in the presence of either chrome mordants or acid dyestuffs generally improves penetration and levelness of shade, and yet at the same time retards the speed of dyeing and reduces shrinkage of woolen piece goods. The same general remarks refer to the advantages to be gained by the use of these auxiliaries in rayon dyebaths.

There is scarcely a process in the entire field of textile finishing which cannot be improved or aided by the use of surface-active agents

Wetting Agents

THERE are a large number of wetting agents used in the textile industry and in many cases their applications overlap with the detergents. Frequently, detergents also possess outstanding wetting power and are able to fill both roles. The following are the main requirements of a suitable wetting agent to be used in the textile industry:

1. The compound must possess the ability to wet the material very quickly irrespective of weave or thickness. There are a number of means of determining wetting power, but most of them are based on the measurement of the amount of solution of an agent that penetrates a piece of the test material within a definite period of time.
2. The wetting agent must be readily soluble in water at all temperatures and give clear solutions.
3. The auxiliary must be neutral in reaction and unaffected by the presence of alkalies, acids and salts.
4. The textile assistant must exercise powerful wetting power at low dilutions and show resistance to "exhaustion" when employed in dyebaths, bleachings, etc.

The textile industry has found, as the result of experience, that the use of wetting agents makes possible a speeding up of such processes as kier-boiling, mercerizing, carbonizing, felting, scouring and sizing, and dyeing, and moreover, permits appreciable economies to be effected where soap and alkalies are normally employed. It is freely acknowledged in the textile industry that without the use of wetting agents to improve speed and penetration of aqueous processes there would be a considerable waste of time and labor.

Emulsifiers

THESE auxiliaries are of great practical importance to the textile finisher who is faced with a number of processes which require water-in-oil or oil-in-water emulsions. The oldest and best known emulsifier is, of course, Turkey Red Oil, the discovery and development of which was due to the work of John Mercer. In addition to the sulfonated oils there are the synthetic detergents, such as sulfonated fatty alcohols, which combine emulsifying and dispersive properties, and also several specialized products. These include cationic soaps for use at all working pH values, and emulsifying agents suitable for preparing specific types of emulsions. Such compounds as sulfonated polyvinyl alcohols have also been used as dispersing and emulsifying agents in Europe.

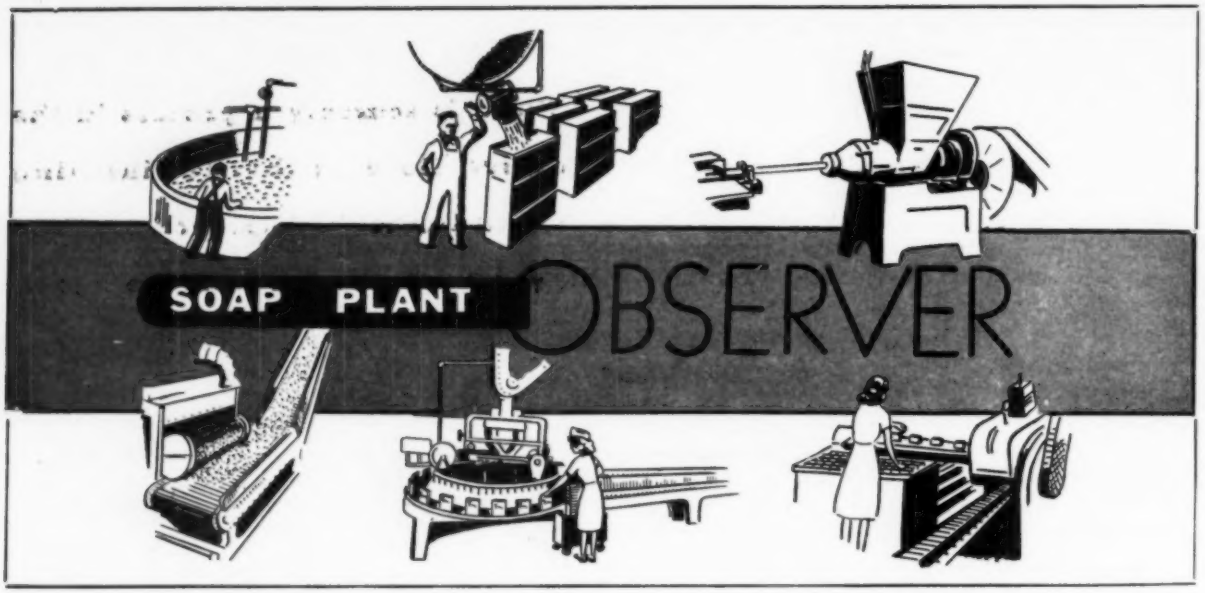
Aminohydroxy compounds derived from the nitroparaffins are also of considerable interest as emulsifying agents. There is no universal emulsifier and the textile finisher usually has available several different products, each one being known by experience to suit a particular operation. By reason of their versatility, the cationic detergents promise to have a wide use and their employment has opened up interesting new possibilities, e.g. the fact that they give a positive charge to textile fibers instead of a negative one enables the finisher to obtain special effects. This has been exploited in the treatment of rubber fibers with latex emulsions. Emulsifiers for general use in the textile industry should meet the following needs:

1. They should be free from unpleasant smell, colorless or near colorless and easy to dissolve.
2. The emulsifier should be an innocuous chemical without any bad effect on delicate textile fibres.
3. Emulsions should be easy to prepare without excessive agitation.
4. Emulsions once prepared should be capable of dilution to any required degree.
5. Emulsions prepared by their use should be stable under the conditions of use.

To ensure success it is essential that users of emulsifiers should be made fully aware of the properties of the emulsifiers.

"Nacconol NRSF" has a general deodorizing action on perfumery compounds, domestic odors, and personal odors. The extent of the deodorizing action varies with the many types of odorous chemicals. While this deodorizing action introduces problems in perfuming, it is an advantage in those cleaning operations where it is desired to remove or prevent odors. If traces of odorous substances such as perspiration are not completely washed away during the cleaning operation, small residues of the synthetic detergent which are likewise left will aid in reducing the odor.

While incomplete washing and rinsing are generally not recommended, there are times when complete rinsing is impractical. In such cases any deodorizing action from residual detergent is a distinct advantage. L. H. Flett, G. C. Toone, and E. L. Booth, *Am. Perfumer 49*, 612-17 (1947).



IF a small soaper is having production problems, your observer is always willing to lend a helping hand if he can. By and large, however, we feel that an expert should be called into the plant. Often, the problems are beyond the likelihood of an effective answer when it must come from the editorial desk. "Absentee" recommendations to some of the many inquiries, when not based on an "on the spot" analysis of the problem, are offered with considerable hesitation and simply for what they are worth as a guide or to stimulate the inquirer along lines of approach to his problem. The best solution always is—if you haven't got technical brains in your outfit, *buy them.*

One subscriber has been having trouble with cracking and streaking of his soap cake for quite a long time now and has written us of his formula and process, asking that we recommend any changes which might help to produce a "better" bar. Here are some excerpts from his letters:

"The following materials are used in the manufacture of toilet soap:

630 lbs. tallow
63 lbs. cocoanut oil fatty acids
300 lbs. water
103 lbs. flake caustic
50 lbs. bentonite
10 lbs. petrolatum
10 lbs. borax

"The 'first four' ingredients are boiled together, and after saponification has been completed, the entire mixture, including the glycerine, is placed in the crutcher for one-half hour. Borax is added, and mixing is then accomplished for one-half hour. Then all is transferred to a soap frame. After the soap is cooled and chipped, bentonite and petrolatum are added along with the dye and perfume. This is again mixed, milled, and pressed into bars.

"Our formula used to call for soda ash and pyrophosphate, but they are no longer included in the hope that they were the cause of the cracking and white streaks which we are trying to avoid.

"As you will notice, we use a proportion of 10 parts tallow to one part cocoanut. Would a greater amount of cocoanut lower the titre so as to help correct our difficulties?

"Since reading your article in the May issue of *SOAP AND SANITARY CHEMICALS* I am contemplating the substitution of 10% red oil and 2% wetting agent for an equivalent amount of cocoanut oil fatty acids. Please let me know whether the substitutions of red oil and wetting agent are likely to introduce any difficulties such as streaking or cracking. I am thanking you in advance for any help you might be able to give."

WELL, your observer's column was not intended as a "clinic" but rather to point out the latest technical and production innovations as he came across them out in the plants, but if a soaper is in trouble we will try to help. The main difficulty again is that there is not enough of the right kind of information submitted. The first few lines of his quoted information lead to many questions: How is he boiling his first four ingredients? Why doesn't he react them in the crutcher in the first place? What means of heat and agitation is he using? How is he handling his caustic soda lye makeup? Let us first discuss his formula and then attempt to outline a procedure of process that he may try first in a small batch and, after proper observation of the finished bars, consider adopting for full scale plant production.

In the first place we would not favor adding more oleic acid at the expense of cocoanut oil fatty acids. It is hard to get good odorless oleic acid and, more to the point, there is ample oleic acid available from the tallow content. I would rather favor increasing the lauric acid content by going up to 15% of the oil blend with cocoanut oil or CNO fatty acids.

Let's analyze the titer. With tallows running around 42°C. and cocoanut oils around 22-23°C. the

calculated titer for a 10 to 1 tallow-CNO ratio would be up around 40°C. If he is using very hard tallow from western sources, it is likely that his calculated titer may be even higher than 40°C. Most of the good toilet soaps on the market run around 36 to 38°C. in titer and a toilet soap of 39°C. and over is not easy to mill in such a way that cracks will not show up on the cake when it is on the wash-stand. The first thing our soaper should do then is regulate his oil blend so as to achieve a calculated titer of 37 or 38°C.

HOW about the lye requirement for this formula? If he uses a good grade of caustic flake, his lye is running around 32°Baumé. A rough check of the lye requirement for the poundage of oils he uses(assuming a saponification value of about 195 for the tallow and about 256 for the CNO, or slightly less for the commercial CNO fatty acids now on the market) indicates a lye requirement of between 385 and 390 lbs. of 32°Baumé lye for 693 lbs. of an oil blend with a 10 to 1 tallow-CNO ratio. But he is using considerably more lye than this —403 lbs. of about 32°Baumé in strength. I am wondering if his product is not testing slightly strong, a condition that might lead to cracking. He does not mention any evidence of free caustic alkalinity in the bar, however.

Soda ash is not recommended as a "builder" for toilet soaps although small amounts of tetra potassium pyrophosphate have special use as such. Although borax may take up some excess caustic alkalinity, its use is questionable because it may cause discoloration and darkening of the soap. There is no objection to the use of petrolatum as a superfatting agent however if lanolin is used, its traces of free fatty acids may help to reduce free alkalinity. However, it should be emphasized that residual caustic in soaps should be eliminated by means other than superfatting — which has a different function.

Technical problems of process cannot always be solved "in absentee" but ideas from the readers often bring aid to a fellow soaper needing advice

IT is hard to figure out just what our soaper is doing in the processing of his soap. Your observer would suggest that he first prepare a semi-boil type soap by completely saponifying his oils with the correct amount of caustic right in the crutcher. As the soap becomes smooth and plastic, but before its temperature has decreased appreciably, the bentonite should be added and finally, after enough agitation to disperse the clay, the superfatting agent may be added. Two or three minutes of agitation should be sufficient to disperse the superfatting agent. The soap should then be cooled down until it will just pour, the dye added, and after a few minutes agitation the soap is ready for the frames. It might be possible to incorporate the dye with the petrolatum. The perfume should be added to the chipped soap prior to milling.

The question of the addition of a wetting agent brings up some interesting points. Anionic and non-ionic types are compatible with a soap base and it would be interesting to try out some of these surface-active agents. I would not add them at the expense of the cocoanut oil, however, but in place of tallow. A liquid type of synthetic such as a potassium or sodium salt of lauryl sulfate may be added in small percents just before framing. The cost of such a material does not compare favorably with other soap raw materials however. National Aniline Division of Allied Chemical and Dye Corp., New York, has done considerable experimental work on this subject and finds that even the inclusion of 40% sodium sulfate in a synthetic detergent does not lead to shortness of a full-boiled soap as the surface-active material seems to increase the soap's ability to take up electrolytes without being "short." According to Dr. L. H. Flett of National Aniline, as much as 5 to 10% (based on weight of finished product) of Nacconol-HG may be incorporated in a toilet soap. This synthetic agent is similar to the well known Nacconol-NR but is more concentrated. It would add an item costing 19.5 cents a pound to the raw material list, however. Your observer would appreciate hearing of any other synthetic detergents that might fit into the picture here and he would also like to hear of your comments regarding the problem discussed in this issue.

In summary, it would appear that the answer to this soaper's difficulty is not so much in trying to find something to add but rather in reducing his titer, producing a neutral, semi-boiled soap in the crutcher, completely blending in his additives, and using correct milling technique in the milling room.

An article on Residual Causticity will soon appear in "Soap"

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An olefinic hydrocarbon containing at least 6 carbon atoms is mixed with at least 1 atom of sulfur per molecule of hydrocarbon and heated to 100-200° C. for an hour. The product is hydrogenated catalytically at 100-300° C. under a pressure of 10 atmospheres or more, until the reaction is complete. The product is cooled and oxidized to a sulfonic acid. Canadian Industries Ltd., Canadian Patent No. 441,495.

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An apparatus for the solvent extraction of oil from seeds, nuts, or the like, is described, in which the extracted solid material is subjected to agitation on a vibratory screen prior to drying. The screen shakes out a large percentage of solvent miscella, using a minimum amount of power and without compressing the meal; this permits the remaining solvent and water to be easily driven off. R. A. Bellwood. British Patent No. 584,272.


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TRADE NEWS. . . .

Avon Opens in Chicago

Avon Products Corp., manufacturers of cosmetics and toilet articles, recently opened a general sales office in Chicago. Melvin Davis, Chicago manager, announced that the firm has leased 8300 square feet on the 21st floor of the Merchandise Mart where more than 65 persons will be employed. Avon maintains factories in Suffern, N. Y., and Pasadena, Calif., and manufactures more than 125 different cosmetic items.

Crutcher Joins Guillory

W. Jack Crutcher recently became associated with Guillory Sales Co., Memphis brokers of cotton seed and soy bean products. In July of 1946, Mr. Crutcher became chief of the soap and glycerine section, industrial oils division, fats and oils branch of USDA, which he joined early in the war, later taking charge of its edible oils division. Before entering government service, he was assistant to the sales manager, Memphis sales division of Southern Cotton Oil Co., New York.

New Kelite Chicago Plant

Chicago operations of Kelite Products, Inc., will be moved about Nov. 1 from 315 W. Hubbard St., to a new plant now under construction at 3401 W. Touhy Ave., in the Lincolnwood suburban area, it was announced last month by W. G. Nuelsen, president. The new, 1-story, modern, factory type building, costing about $100,000, will cover 17,000 square feet. All manufacturing operations will be on one level, thus permitting more efficient and less expensive production, than in the present downtown Chicago quarters, Mr. Nuelsen said. A railroad siding will also be available for direct loading of shipments and there will be adequate space for outdoor storage tanks. The new plant will serve the Mid-West territory with the company's cleaners for industrial, aeronautical, automotive and other fields.

Peter Zonnevylle Dies

Peter Zonnevylle, one of three brothers to operate the M. J. Zonnevylle Sons Soap Co., Rochester, N. Y., recently died at the age of 65. He is survived by his wife, son, and two brothers. The soap company was founded 53 years ago by his father, Michael J. Zonnevylle, who died in 1935. Peter and his brothers, John and Edward, entered the business with their father on a partnership basis 25 years ago.

Lever Lowers Prices

Lever Bros. Co., Cambridge, Mass., announced the reduction in the price of "Swan" soap and of its vegetable shortening, "Spry," by approximately 8%. The reduction became effective August 8th. Current price reductions have brought cuts in the price of Swan to a total of 22% in the past five months.

Redesign "His" After Shave

The House For Men, Inc., Chicago, has recently introduced a new container for its "His" after shave lotion, designed to resemble a tuxedoed male torso. Shaped to fit a man's wet, soapy hand with a non-skid grip, the new container is furnished in deep burgundy color with an ivory plastic stopper bearing the "His" trade mark.

Lorraine Elects Brewster

Ray Brewster was recently elected president of Lorraine Compounds, New York, a company formed for the manufacture and distribution of a new cleaning compound designed for use on woolens and fine silks, and marketed under the name "Tern." Mr. Brewster resigned recently from Sterling Drug Co., New York, where for five years he was divisional vice-president in charge of sales and advertising for the Frederick Stearns and Co. division. He was for fourteen years national sales manager in charge of household products for E. R. Squibb and Son, New York.

Ralph P. Lewis, president of Harriet Hubbard Ayer, Inc., capital stock of which was recently acquired by Lever Brothers Company, Cambridge, Mass., is welcomed to his new post by his predecessor Mrs. Lillian S. Dodge who became president of Harriet Hubbard Ayer, Inc. in 1918. She will continue to be identified with the business in an advisory capacity to Mr. Lewis.

Soap Sales Level Off

Although sales of soaps other than the liquid types remained about the same for the second quarter of 1947 as for the corresponding period in 1939 and three per cent above the quarterly average for the years 1935-1939, the average person in the United States still is getting less soap than before the war, judging from the quarterly report of soap deliveries issued July 29th by Roscoe Edlund, manager of the Association of American Soap and Glycerine Producers, New York. This census is based on reports from seventy manufacturers who represent a substantial proportion of the entire soap production of the country.

Total sales by these manufacturers of other than liquid soaps during the second quarter ending June 30th amounted to 642,984,000 pounds. However, the population has grown from 129 to 143 million persons which fact points out a lower soap consumption per capita since the war. Deliveries in the quarter ending June 30th declined 5.2% from the previous quarter, but for the half year ending June 30th, they were 1,321,363,000 pounds and were 8.5% higher than in the first half of 1946. Liquid soap deliveries totaled 1,388,000 gallons for the six months, a decrease of 14.3% from the corresponding period in 1946.

Wins Trade Mark Right

Swift and Co., Chicago, won a court decision recently in connection with its application for the registration of "Woolen Soap" as a trade mark for toilet and bath soaps and soap in flake form. First Assistant Commissioner Frazer reversed the action of the Examiner of Interferences who had previously sustained the opposition of Wool Novelty Co., New York, to Swift's application for the trade mark.

Ungerer Buys Hickok

Ungerer and Co., New York, recently announced the purchase of the business and assets of John N. Hickok and Son Co., Brooklyn manufacturers of flavors since 1883. D. Honan, who has been a partner in the Hickok Co. for many years, will remain in charge of manufacturing. In the future, flavors will be manufactured in Ungerer's new plant in Totowa, N. J.

Colgate Earnings Rise

Higher sales in 1947 resulting from an increase in the volume of products sold and higher selling prices boosted earnings for Colgate-Palmolive-Peet Co., Jersey City, to a net income of $9,783,002 or $4.78 a common share for the six months ending June 30th, 1947, as against $6,311,156 or $3.10 a share for the like 1946 period. Domestic sales for the first six months amounted to $132,306,711 as compared to $72,839,504 for the like 1946 period. Total world-wide sales amounted to $159,428,336, an increase of $66,356,808 over the first half of 1946. Soap prices, which were increased late in 1946 as a result of higher raw material costs, were decreased substantially in April and again in June of 1947 as raw material prices declined, said E. H. Little, president of the company.

Philippine Mfg. Rebuilds

Procter & Gamble Co.'s Philippine Mfg. Co., is back in production again, a story in *Moonbeams*, the company's house organ, states. Buildings damaged by war have been repaired or rebuilt and new production machinery installed. Copra crushing has been resumed and the first products made included salad oil and shortenings. A yellow and a white bar soap are soon to be made and the plant will also make its own tin cans. The company's far eastern factory at Soerabaya, Java, which was used by the enemy during the war, is also back in production for its owners, the story states.

Engineering Firm Starts

The American Pacific Industrial Corp., composed of both American and Chinese engineers, recently opened offices in New York City. The corporation is the domestic, as well as export, representative of several manufacturers and is now working on a number of construction projects for China. John W. Foster is president of the new organization.

Study Dairy Cleansers

Investigators at the Florida Agricultural Experiment Station, Gainesville, Fla., have been studying the effect of Florida waters on the efficiency of washing powders commonly used in that State for cleansing dairy equipment. Analysis of water samples from various areas resulted in their classification into three types, soft, hard and very hard. Using a Deterg-O-Meter machine, washing trials were then made with 59 general purpose commercial washing powders in the three types of water. Solubility and sudsability of the powders, it was concluded, were not materially affected by the water hardness. About 50 per cent of the powders used were classified as "good" in all three types of water; 6 per cent "fair" or "poor" in soft water; 15 per cent "fair" or "poor" in hard water and 29 per cent "fair" or "poor" in very hard water.

Dreyer Advances Zirkel

George H. Zirkel was recently elected vice-president of P. R. Dreyer Inc., New York importers and specialists in essential oils and aromatic chemicals. Mr. Zirkel is celebrating his thirtieth anniversary in the industry, having started with Rickhill & Veitor in 1917. He replaces H. A. Wiedman who recently resigned.

Joins Polak & Schwarz

H. A. Wiedman became associated with Polak & Schwarz, Inc., New York, on August 25, 1947, as purchasing agent. Mr. Wiedman has been identified with the essential oil, aromatic and associated trades for the past 30 years. He recently resigned as vice-president of P. R. Dreyer Inc., New York after being with the company for 12 years.

Chem. Salesmen Golf

The Salesmen's Association of the American Chemical Industry, New York, met August 14th for lunch, golf and dinner at the Winged Foot Golf Club, Mamaroneck, N. Y. E. A. Bush, Bush Aromatics, Inc., New York, was entertainment committee chairman.

Lee Views Soap Situation Abroad

SOAP-MAKERS in India as well as in other lands are anxious to increase their production but are hampered by a lack of available dollar exchange says Alan Porter Lee, consulting engineer to the fats, oils and soap industry, who recently returned from a month's business trip in India and Europe during which time he traveled over 20,000 miles. Mr. Lee spent two weeks in Bangalore, India and near-by points making a survey in preparation for the design of a large new laundry and toilet soap plant and then went to Bombay for 10 days where he visited several edible oil refining plants and soap factories, among them the toilet soap plant of the Tata Oil Mills Co. which he had designed and equipped in 1941. On his return trip, while in Paris, he visited the soap machinery manufacturing plant of A. Savy Jean-Jean et Cie, and also the soap plant of Monsavon Cie and in London he visited the soap machinery plant of Henry Simon, Ltd. at Cheadle-Heath near Stockport.

ALAN PORTER LEE

Conditions in the soap industry in France are still most difficult, according to Mr. Lee, for with government controls on raw materials still existent, no fat that can be refined for edible use ever reaches the soaper's kettle. Deliveries on soap-making equipment in both France and England in most cases are more extended than in the U. S. The demand for soap and soap products in India and Europe has increased since the war and the suppliers, feeling the pressure, are turning mostly to the United States for equipment and technical advice, but there appears no immediate solution until foreign buyers can better their dollar exchange or produce enough so that they will have some exportable commodities. Per capita soap consumption in India is now about 0.2 pounds.

Ampion Buys Eagle Assets

Ampion Corp., Long Island City, recently purchased machinery, laboratory equipment and stock of vegetable oils from Eagle Soap Co., Brooklyn. Leonard B. Schwarcz, president, Ampion Corp., announced that the vice president of the Eagle Soap Co., has resigned. Mr. Schwarzc is now owner of all stock in the company.

Atlas Adds Sales Office

The establishment of a western district sales office in Los Angeles for its industrial chemicals department was recently announced by Atlas Powder Co., Wilmington. James H. Turner, technical representative, has charge of district sales of organic chemicals including sorbitol, mannitol, and surface-active agents. Mr. Turner, a graduate of Lafayette College, served five years in the Army during the war and joined Atlas in 1946.

B. W. Fink Dies

B. W. Fink, retired vice-president and general manager of the FR Corp., New York, manufacturer of soap powder, died August 13th. He was 60 years old.

Lever Appoints Schneller

Frederic A. Schneller was named general merchandising manager of Lever Brothers Co., Cambridge, Mass., effective September 1st. Mr. Schneller comes to his new post from the vice-presidency of Cramer-Krasselt Co., Milwaukee advertising agency where he has been located since 1945. He is a native of Iowa and a former newspaperman.

FREDERIC A. SCHNELLER

Westvaco to Mine Trona

A commercial deposit of natural sodium carbonate at Westvaco, Wyo., has been tapped by Westvaco Chlorine Products Co., New York, after a year of drilling operations. Westvaco said that indications are that several million tons of high purity sodium sesquicarbonate are immediately available for mining and conversion by calcination to soda ash from a ten foot thick bed of sodium carbonate at a depth of 1,490 feet. Conditions at the 1,500 foot level were reported good for low-cost mechanical mining.

Swift Buys Canadian Firm

Swift Canadian Co., Ltd., Toronto, recently purchased Wonderful Soap Company, Guelph, Ontario, from W. Harris & Co. The firm will be utilized for the manufacture of industrial soaps for sale chiefly in eastern Canada. Manager of the plant is T. J. Jones.

L. A. Soap Co. Expands

Los Angeles Soap Co., Los Angeles, is planning to construct a new five-story and basement factory in Los Angeles. The new concrete and steel building will be 50 by 115 feet in dimension.

A Sparkling Floral Trio

Velvetine will impart sparkle and brilliance to ost any blend, adding a touch of charm and istinction without changing its general character- tics. *Iso Cyclo Citral-S* imparts a genuine lush reen note. Its clean, refreshing odor makes it the erfect masking agent. *C-66* lends an appealing rispness wherever Lily-of-the-Valley is an impor- tant constituent. Its Muguet character is consid- erably more intensive than Hydroxy Citronellal, and produces very interesting effects. ◇ These three new specialties enhance the finest perfumes, yet are well within reach of the soap perfumer. ◇ A request on your company letterhead will bring working samples and complete information.

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To Discuss Detergents at ACS Meeting

THE 112th national meeting of the American Chemical Society, being held September 15 through 19, 1947 at the Hotel Pennsylvania, New York, will feature a number of chemical papers of interest to soap and sanitary chemicals manufacturers and dealers. On the subject of detergency are: "Soiling, Storage, and Washing of Soiled Cloth" by W. P. Utermohlen, Jr. and E. Louise Wallace, and "Diphase Metal Cleaners. II. Relation of Detergent Performance to Emulsion Cleaner Stability" by Irving Reich and Foster Dee Snell, Foster Dee Snell, Inc., New York. Lawrence H. Flett, National Aniline Division, Allied Chemical & Dye Corp., New York is presenting a paper on "Synthetic Detergents. Application of Research Methods"; and M. S. Morgan and L. H. Cretcher are offering a paper titled: "A Kinetic Study of Alkylation by Ethyl Arylsulfonates." On the subject of soap are: "Differential Thermal Analysis of Soap Bars Subjected to Various Processing Conditions" by M. B. Vold, R. D. Vold, and B. Griffiths; "Relations between Rheological Behavior, Phase State, and Processing Conditions in Soap-Water Systems", by R. D. Vold, C. C. Konecny, and L. L. Lyon; and "Soap Micelles that Solubilize Dimethyl Phthalate, Insoluble in Water and in Hydrocarbons", by James W. McBain and Harriette McHan.

Among over twenty papers being presented on the subjects of insecticides and weed killers are a number which will be of interest to our readers: "The Insecticide Industry and its Contribution to Food Production," L. S. Hitchner; "Insecticides on Stored Products," J. C. Frankenfeld; "Inorganic Insecticides," L. B. Norton; "The Role of Surface-Active Agents in Foliage Sprays," F. Wilcoxon; "Old and New Methods of Applying Insecticides," Robert D. Glasgow; "The Relation of Chemical Research Laboratories to the Development of New Insecticides and Fungicides," M. D. Farrar; "The Residual Action of Organic Insecticides," Elmer E. Fleck; "Hexaethyl Tetraphosphate and Tetraethyl Pyrophosphate," S. A. Hall and Martin Jacobson; "Possible Propellants for Use in Liquefied Gas Aerosols," R. A. Fulton; "The Newer Weed Killers and Their Role in Food Production," L. W. Kephart; and "Insecticidal Properties of Methylenedioxyphenyl Cyclohexanones," Oscar F. Hedenburg and Herman Wachs.

Marvin Eavenson Dies

Marvin S. Eavenson, owner of the Eavenson Chemical Co., New York, recently died at the age of 47. For 17 years he was New York divisional sales manager for the industrial sales department of the Colgate-Palmolive-Peet Co., Jersey City, and was also sales manager of the National Oil Products Co., Harrison, N. J. His grandfather founded J. Eavenson and Sons, Camden, N. J. Mr. Eavenson was born in Philadelphia, attended the University of Pennsylvania, and was in the Navy in the first world war. He is survived by his widow, the former Clara Rodenbough; two daughters; his father, Roland M. Eavenson; two sisters, and a grandfather.

Monsanto Completes Plant

Completion of a new $3,000,000 plant at Monsanto, Ill., for the manufacture of the synthetic detergent "Santomerse No. 1" was announced August 11th by Monsanto Chemical Co., St. Louis. Production of Santomerse will also continue at Monsanto's Nitro, W. Va., plant which has been manufacturing Santomerse for a number of years.

Southern Appoints Haley

Appointment of E. Wayne Haley as director of sales for Southern Alkali Corp., was announced in mid-August by W. I. Galliher, executive sales manager for the Columbia chemical division, Pittsburgh Plate Glass Co., Pittsburgh, and its subsidiary, the Southern Alkali Corp. Associated with Southern Alkali since 1935, Mr. Haley has served as assistant director of sales during the past twelve years. Mr. Haley succeeds Eli Winkler who will continue with the firm in the capacity of sales consultant. Mr. Galliher also stated that H. W. Gleichert, director of sales for Columbia chemical division, will continue in that capacity.

AOCS Chicago Meeting

Details were recently released on the 21st fall meeting of the American Oil Chemists' Society to be held at the Edgewater Beach Hotel, Chicago, Oct. 20-22. G. A. Crapple, Wilson Co., is general chairman, and R. T. Milner, Northern Regional Research Laboratory, Peoria, Ill., president of the society will act as presiding officer. H. C. Black, Swift and Co., Chicago, is program chairman of the meeting and assisting him is L. B. Parsons, Lever Brothers Co., Cambridge, Mass., fourth vice-president in charge of soap section, and E. W. Colt, Armour Soap Works, Chicago. Other members of the program committee are A. R. Baldwin, K. F. Mattil and B. W. Beadle.

Safety Congress to Meet

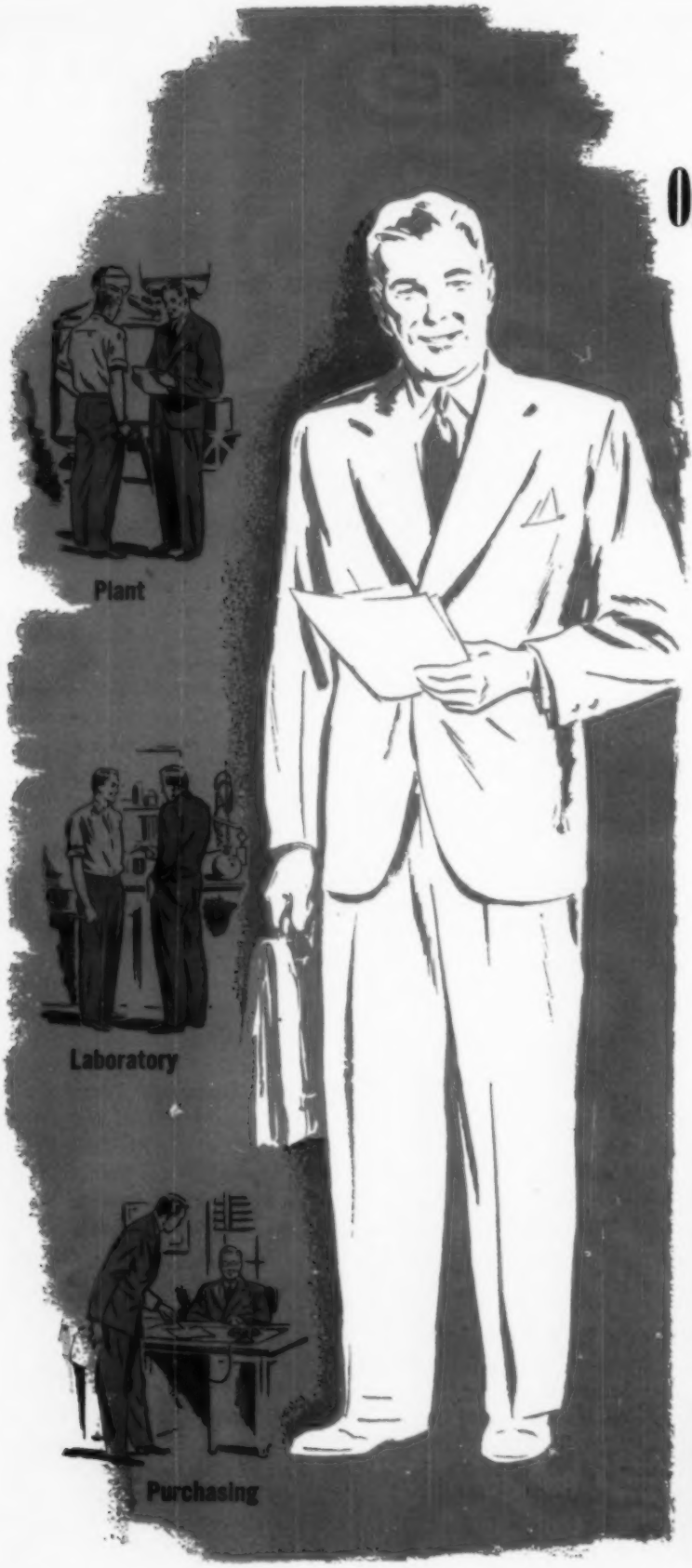
The 35th National Safety Congress and Exposition, sponsored by the National Safety Council, will meet in Chicago from Oct. 6-10, 1947. Sessions on industrial safety as well as public safety will be featured at the exposition.

Woburn Appoints Dugdale

Charles H. Dugdale was recently appointed comptroller by Woburn Chemical Corp., Harrison, N. J. Mr. Dugdale formerly was head of the cost department as assistant to the vice-president in charge of operations. Mrs. Eleanor Delaney, formerly in charge of the payroll department, has been promoted to the position of assistant comptroller.

C-P-P Transfers Lachner

Marshall S. Lachner, former manager of Colgate - Palmolive - Peet Co.'s Jersey City district, has been transferred to Chicago, as district manager in place of J. Hillman, retired.



One man—serving all three —saves your time

For more than twenty years Carbide and Carbon Chemicals Corporation has maintained a staff of technically trained representatives to serve its customers throughout the country. Now, more than ever, this policy means time and effort saved for you.

Every Carbide representative is a graduate chemist or chemical engineer. This basic technical knowledge, plus research experience in our laboratories, special training in our home office, and practical knowledge gained in the field, gives our representative the background needed to be of assistance to all three, the men in your plant, your laboratory, and your purchasing department.

When you have problems involving the use, development, or purchase of chemicals, call our nearest office and discuss them with a Carbide representative. And if you would like a copy of our catalog, "Synthetic Organic Chemicals," please address Department **C-8.**

CARBIDE and CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities

In Canada:

Carbide and Carbon Chemicals, Limited, Toronto

St. Paul Consumer Analysis

A new consumer analysis was recently started by the St. Paul Dispatch-Pioneer Press, titled "Consumer Analysis of the St. Paul Market." Containing over 170 pages, the report is divided into six general catagories—foods, soaps, toiletries, beverages, home equipment and general habits. The section dealing with soap products covers 19 soap items and for each of these the number and percentage of families which buy the item, the number and percentage of buyers by income groups, the total number of brands in the market, consumer preference for the leading brands, and in many cases, the store distribution of the brand are given. In addition, general consumer habits relative to soap buying in the area are discussed.

The soap section discusses bluings, bleaches, cleaners for drains, rugs and metal utensils, scouring powders, household deodorants, floor waxes, laundry starch, water softeners, window cleaners as well as the usual types of soap products. The most popular brand of powdered scouring cleanser is "Old Dutch" with "Royal Lemon" next and "Bab-O" third choice. "Bon-Ami," "Brillo" and "Lava" are the most popular cake scouring cleansers. "Lan-O-Sheen" is the most popular "synthetic soap" in this area with "Dreft," "Vel," and "Swerl" following in that order of preference. The first four in laundry soap popularity are: "Oxydol," "Rinso," "Duz" and "Fels Naptha" bar. "Dreft" is first choice as a soap for dishes with "Ivory" bar soap, "Vel" and Oxydol" following in that order of preference. "Lux Flakes" leads the list of soaps most popular for use on fine fabrics. "Ivory Flakes" and "Dreft" share the major portion of the remainder of this market.

Swift Schedules New Units

Construction of two units of the new technical products plant at Hammond, Ind., for Swift and Co., Chicago, is expected to be under way soon. The new plant will process special oils for textiles, soaps, cosmetics and other specialty products. One building, 180 x 144 feet, will be two stories, brick, reinforced concrete construction, housing the offices, laboratory, shipping facilities, and some processing. In the other building, 50 x 65 feet, equipment for the manufacture of industrial oils will be installed. Completion of the new units is scheduled for some time in 1948.

Issues Fat Salvage Data

In five years of operation, the American fat salvage program has been responsible for collections of used fat amounting to 810,000,000 pounds, it was recently announced by Roy W. Peet, chairman of the American Fat Salvage Committee, New York. Mr. Peet pointed out that during the past sixty months an average of 13,500,000 pounds of fats and oils were turned over to industry each month. Of the total amount of fats and oils salvaged, 625,000,000 pounds were saved by American housewives and the remaining 185,000,000 pounds were recovered by the armed forces. The program has contributed approximately 10% of total domestic production of fats and oils.

Solvay Offices Move

Solvay Sales Corp., New York, has announced that their New Orleans and Houston branch offices have moved to new quarters in their respective cities. The New Orleans branch is now located at 1107 Pere Marquette Building, Baronne St., New Orleans, and the Houston office is now established at 1313 City National Bank Building, 921 Main St., Houston.

Wants Agent for Cleaner

Emile Baillon Brebrieres (Pas de Calais, France) manufacturer of a product for cleaning windows and mirrors as well as chromium and nickel parts on automobile bodies, is interested in obtaining a distributor in the United States. The product is said to be non-inflammable and does not freeze at low temperatures. It can be applied with the use of a hand sprayer or electric vaporizer without the use of water. At the present time, the product is used by the French National Railways for cleaning cars and station installations, by Air France Lines and by local streetcar and bus companies.

Gillam Markets "EGO" Soap

Gillam Soap Works, Fort Worth, recently featured an advertising campaign in the local papers about its household package soap, "Ego Soap Powder" which now comes in a new "junior" one-pound, blue package in addition to the standard size carton. The theme of Gillam's advertising campaign was an expose of soap operas as portrayed by actors of "The Hucksters" which appeared at the Worth Theatre, Fort Worth, during the week of the newspaper advertising.

NEW TRADE MARKS

The following trade-marks were published in the August issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

Trade Mark Applications

GLIM—This in upper and lower case, extra bold, black letters for synthetic detergents in liquid form. Filed May 9, 1946 by General Aniline & Film Corp., New York. Claims use since Apr. 2, 1946.

MIGHTY FOAM—This in upper case, bold and open letters across the face of a sphere resembling a bubble being held on the shoulders of a fanciful male figure for rug and upholstery cleaners. Filed Sept. 3, 1946 by Mighty Foam Co., Scranton, Pa. Claims use since July 10, 1946.

FIGARO—This in lower case, medium letters for shaving cream. Filed Sept. 9, 1946 by Figaro Mfg. Co., Grand Rapids, Mich. Claims use since Aug. 15, 1946.

LAUXIDE—This in upper case, bold letters for insecticide in liquid and powdered form. Filed Sept. 22, 1945 by Monsanto Chemical Co., Seattle, Wash. Claims use since Jan. 19, 1945.

DE-PESTER — This in upper case, extra bold, black letters for insecticide. Filed Dec. 22, 1945 by Southwestern DDT Corp., Dallas, Tex. Claims use since Dec. 1, 1945.

SPRITZ — This in upper case open letters for insecticides. Filed Jan. 28, 1946 by Monarch Chemical Co., New Orleans, La. Claims use since Oct. 8, 1945.

P-40—This in upper case, bold, black letters and numerals for insecticide. Filed Mar. 27, 1946 by Plant Products Corp., Blue Point, N. Y. Claims use since Feb. 23, 1945.

LA-RAY — This in upper and lower case, reverse and regular, script letters across the fanciful drawing of a woman's figure for oil shampoos. Filed July 25, 1946 by La-Ray Products, Elgin, Ill. Claims use since Mar. 25, 1946.

PENNSALT—This in lower case, extra bold, black letters for insecticides. Filed Sept. 21, 1946 by Pennsylvania Salt Manufacturing Co., Philadelphia. Claims use since Apr. 22, 1946.

ODORLOST — This in upper case, extra bold, black letters for deodorants dispensed in air colloid spray or evaporative form. Filed Oct. 3, 1946 by Pennsylvania Engineering Co., Philadelphia. Claims use since Sept. 18, 1946.

SUNWAX—This in upper case, bold, stencil letters for microcrystalline and crystalline petroleum wax. Filed Dec. 24, 1946 by Sun Oil Co., Philadelphia. Claims use since Feb., 1945.

SUN MICROWAX—This in upper case, bold, stencil letters for microcrystalline petroleum wax. Filed Jan. 2, 1947 by Sun Oil Co., Philadelphia. Claims use since May, 1945.

NOPCOWET — This in upper case, bold, stencil letters for wetting agent. Filed May 4, 1946 by Nopco Chemical Co., Harrison, N. J. Claims use since Nov. 19, 1940.

KALUK — This in upper and lower case, extra bold, black letters for liquid cleaner and liquid metal polish. Filed July 30, 1946 by Kaluk Products Co., Rochester, N. Y. Claims use since June, 1936.

LEISURE—This in upper case, extra bold, black letters for soaps and cleaning compounds. Filed Sept. 14, 1946 by Frederick Soap & Chemical Co., Los Angeles. Claims use since Mar. 15, 1946.

PURSIZE—This in upper case, medium letters for spot remover. Filed Sept. 16, 1946 by Soil-Off Manufacturing Co., Glendale, Calif. Claims use since July 1, 1946.

CARMACHROME—This in upper case, bold letters in the form of an arc for chromium polish. Filed Sept. 20, 1946 by Carmachrome, Canton, O. Claims use since Sept. 11, 1946.

KE-CARB — This in upper case, extra bold letters for liquid for cleaning automotive and engine parts. Filed Sept. 27, 1946 by Kelite Products, Inc., Los Angeles. Claims use since June 1, 1946.

SIX-TWELVE — This in upper case, medium letters for insect repellent. Filed July 29, 1946 by Carbide and Carbon Chemicals Corp., New York. Claims use since July 13, 1946.

SANITOR—This in upper case, bold letters for disinfectants. Filed Sept. 9, 1946 by West Disinfecting Co., Long Island City, N. Y. Claims use since 1912.

PARKO — This in upper and lower case, script letters within a diamond design for chromium cleaner. Filed Feb. 15, 1946 by Park Chemical Co., Detroit. Claims use since July, 1936.

DEXLAVE—This in upper case, open, shadow letters for liquid soap. Filed July 29, 1946 by Michael's Hair Products Co., Brooklyn. Claims use since Apr. 6, 1946.

SOROLENE — This in upper case, medium letters for synthetic detergent. Filed Sept. 10, 1946 by Onyx Oil & Chemical Co., Jersey City, N. J. Claims use since Aug. 7, 1946.

KAMENOL—This in large and small, upper and lower case, bold letters within a box for soap powder. Filed Sept. 20, 1946 by Kamen Soap Products Co., New York. Claims use since Sept. 1, 1946.

MINCOFOS—This in upper case, bold letters, for dairy and general purpose cleansers. Filed Sept. 27, 1946 by Minnesota Chemical Co., St. Paul. Claims use since Sept. 9, 1946.

ZEEP — This in upper case, extra black, bold letters for soap. Filed Sept. 27, 1946 by Minnesota Chemical Co., St. Paul. Claims use since Apr. 1, 1946.

SHIP-SHAPE — This in upper and lower case letters of a rope-like appearance for detergents and soaps. Filed Sept. 28, 1946 by King Research,

Inc., Brooklyn, N. Y. Claims use since July, 1946.

DXI—This in extra large, upper case, open and shadow letters and numeral the "d' and "x of which form the body of a figure in one hand of which is the numeral "I" for washing compounds. Filed Sept. 30, 1946 by Safford Co., Tryon, N. C. Claims use since Aug., 1945.

SPLIT-SECOND—This in upper case, bold, stencil letters for cleaning preparation. Filed Oct. 2, 1946 by Morton S. Pine Co., Cleveland. Claims use since Nov. 20, 1945.

SUPER-TEX — This in upper case, extra bold, black letters for cleaning and polishing preparation. Filed Oct. 2, 1946 by Tex Products, Inc., Newark, N. J. Claims use since July 12, 1946.

PETROHOL—This in upper and lower case, bold letters for solvent material for spot removing and general cleaning purposes. Filed Oct. 3, 1946 by Standard Alcohol Co., New York. Claims use since 1925.

LITTLE SHAVER—This in upper and lower case, bold, script letters for tooth paste. Filed May 17, 1946 by Lillian Cooper Cosmetics, Inc., New City, N. Y. Claims use since May 1, 1946.

CHEMI-TROLL—This in upper case, extra bold letters for insecticides. Filed Aug. 26, 1946 by Chemi-Troll Products, Gibsonburg, O. Claims use since Jan. 15, 1946.

DIVOBAN—This in upper case, extra bold, black letters for insecticide. Filed Dec. 19, 1946 by Diversey Corp., Chicago. Claims use since Nov. 26, 1946.

BL—This in upper case, extra bold, black letters within a bold rule in the form of a semi-circle for disinfectants. Filed Jan. 2, 1947 by Buckman Laboratories, Inc., Memphis. Claims use since Nov. 1 1945.

BSM-II—This in upper case, extra bold, black letters for disinfectants. Filed Jan. 2, 1947 by Buckman Laboratories, Inc., Memphis. Claims use since Nov. 1, 1945.

CLOUDTONE — This in upper case, bold letters for shampoos. Filed Jan. 4, 1947 by Associated Products, Inc., Chicago. Claims use since Nov. 27, 1946.

SUPERTONE — This in upper case, bold letters for parasiticides. Filed Jan. 13, 1947 by California Spray-Chemical Corp., Wilmington, Del. Claims use since Nov. 27, 1946.

BRINSE — This in upper case, bold letters for disinfectant. Filed Jan. 17, 1947 by Bricide Corp., Chicago. Claims use since Jan. 10, 1947.

SEPTO — This in upper case, extra bold, black letters for bowl cleaning compound. Filed Feb. 4, 1946 by Hood Chemical Co., Inc., New York. Claims use since Jan. 4, 1946.

SURGA-HAN — This in upper case, bold letters for liquid surgical soap. Filed Apr. 1, 1946 by Hillyard Chemical Co., St. Joseph, Mo. Claims use since March, 1945.

BEGUINE—This in upper case, extra bold, black letters for shaving creams. Filed Oct. 12, 1946 by Golden Arrow Toiletries, New York. Claims use since Oct. 1, 1946.

KRY-O-CIDE — This in upper and lower case, bold, letters above the letter "c," which is in a box beneath the letters "c" and "d" for insecticides. Filed Dec. 21, 1945 by Pennsylvania Salt Manufacturing Co., Philadelphia. Claims use since Feb. 20, 1945.

ZYLIUM — This in upper and lower case, bold letters for germicides.

Malmstrom Appoints Sunde

N. I. Malmstrom and Co., Brooklyn, have announced the appointment of Dr. Conrad J. Sunde as director of research. Dr. Sunde, formerly a consultant with the conservation division of WPB, was in charge of conservation and utilization of fats and oils, detergents, drugs, pharmaceuticals and insecticides. He received his PhD from the University of Minnesota and was later head of the organic chemistry department of North Dakota Agricultural College.

Woburn Names McFarland

Alan R. McFarland was recently appointed assistant to the vice-president in charge of production for Woburn Chemical Corp., Harrison, N. J. Prior to his accepting a position with Woburn, Mr. McFarland, a commander in the U. S. Navy, was personal aide to Fleet Admiral E. J. King. Mr. McFarland graduated from the U. S. Naval Academy in 1938.

Makes Glycol Esters

Quaker Chemical Products Corp., Conshohocken, Pa., recently announced the manufacture of polyethylene glycol esters under the trade name of "Quakesters." The products are surface-active agents of the nonionic type. Some are excellent detergents; others are high in emulsifying power. Other uses depend upon the plasticizing and dispersing powers of the esters. Water or oil solubility as well as dispersibility of the individual ester is said to vary over a wide range, depending upon molecular structure. Flexibility of chemical and physical properties, enables the products to meet a diversity of requirements in such fields as cosmetics, pharmaceuticals, paints and emulsion products.

Improves Mercol Beads

An improved version of Mercol ST beads was recently reported to be available at lower prices from Seaboard Distributors, Inc., Newark, N. J. By fortifying the beads with phosphates, it has been found that not only greater stability toward dust formation resulted but also better detergency resulted. Also, the foaming qualities of the beads are said to have been improved. A reduction in price was effected on September 1st.

Swift Building at Hammond

Swift and Co., Chicago, has awarded contracts for construction of two buildings which will form part of their new technical products plant at Hammond, Ind.

Fernald Joins Sharples

Mason Fernald, formerly with the sales division of Monsanto Chemical Co., St. Louis, recently joined the development staff of Sharples Chemicals, Inc., Philadelphia, Pa.

For lady-like lavender
...with a dash of distinction

depend on Du Pont

TERPINYL PROPIONATE

Give an extra lift to your lavender, bergamot, floral or fancy bouquets with Terpinyl Propionate, top-ranking terpineol ester.

Terpinyl Propionate is water-white . . . stable . . . an excellent blender even with fruity types. Du Pont production and control assure you of constant uniformity and highest quality.

You have probably used Terpinyl Acetate. Terpinyl Propionate is smoother, rounder in character —helps you create even finer fragrances.

Can Terpinyl Propionate help you improve your product? Du Pont can help solve your perfume problems. Why not ask us? E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Aromatics Section, Wilmington 98, Del. Branch Offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

Du Pont Aromatics

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

DU PONT

REG. U.S. PAT. OFF.

KRANICH SOAPS

MANUFACTURED FROM FATTY ACIDS DISTILLED AND OILS REFINED BY US

MAINTENANCE SOAPS

LIQUID TOILET

40% Concentrated Coconut Oil
32-33% (special) anhydrous, distilled Coconut

LIQUID TOILET BASE

Standard Coconut Oil 60% concentrated
Crystaline Coconut Oil 50% concentrated

POTASH VEGETABLE OIL

Soft Potash 40% anhydrous
Hard Potash 65% anhydrous

LIQUID SCRUBBING

Pine, Sassafrass, Odorless
20% anhydrous

POWDERED COCONUT OIL 98%

(For Detergent Compounding)

*CONCENTRATED means pure soap and glycerine

ANHYDROUS means pure soap only

Kranich Soap Company, Inc.

54 Richards Street **Brooklyn 31, N. Y.**

KRANICH SOAPS

Filed Aug. 2, 1946 by Tykor Products, Inc., New York. Claims use since Apr. 17, 1945.

TARN-NO—This in upper case, extra bold letters for metal tarnish preventive. Filed Oct. 25, 1946 by Tarno Co., Manhattan Beach, Calif. Claims use since June 19 1946.

RAT-TROL — This in upper case, extra bold, black, italic letters for rodenticide. Filed Oct. 31, 1946 by Thompson-Hayward Chemical Co., Kansas City. Claims use since Sept. 19, 1946.

LUSTRAY—This in upper and lower case, bold, script letters for hair shampoo. Filed Dec. 11, 1946 by Iris Beauty Products, Brooklyn. Claims use since July 31, 1946.

PHI-O-SOL — This in upper case, bold letters for wetting and emulsifying agent. Filed Jan. 17, 1947 by Onyx Oil & Chemical Co., Jersey City, N. J. Claims use since March, 1940.

BHC — This in upper case, extra bold, black letters for insecticide. Filed Jan. 31, 1947 by Food Machinery Corp., San Jose, Calif. Claims use since Oct. 17, 1946.

GAMMALOID — This in upper case, bold letters for benzene hexachloride insecticide. Filed Feb. 10, 1947 by American Cyanamid Co., New York. Claims use since Dec. 26, 1946.

PHYSICIANS' AND SURGEONS'—This in upper case, bold letters for soap. Filed July 29, 1946 by The Physicians Supply Co., Cincinnati. Claims use since 1885.

BLING — This in upper case, extra bold letters for chemical spot remover. Filed Aug. 23, 1946 by Remagin Co., Baltimore. Claims use since Nov. 21, 1945.

WHISK — This in upper and lower case, extra bold, black letters for liquid soap for general laundry use. Filed Aug. 26, 1946 by Bay Chemical Co., Bay City, Mich. Claims use since July 2, 1946.

SUE PREE—This in upper and lower case, extra bold, script letters for shampoo. Filed July 11, 1944 by S-P Laboratories, Dallas. Claims use since May 30, 1928.

SWANKY—This in upper case, reverse letters on a rectangular reverse shadow background for disinfectant. Filed Mar. 9, 1946 by Chemical Specialties Co., New York. Claims use since May, 1934.

OLD TRAPPER RAT KRUNCHES—This in upper case, bold letters within a circle, adjacent to and above the fanciful drawing of a man dressed as a woodsman for rodenticides. Filed Apr. 15, 1946 by Stanley Industries, Seattle, Wash. Claims use since Jan. 2, 1940.

PUNCH 'N' JUDY—This in upper case, bold, shadow letters for tooth paste. Filed Aug. 20, 1946 by Albert Bassell, Inc., Ardsley, N. Y. Claims use since Aug. 16, 1946.

SPUMOL—This in upper case, extra bold, black letters for cream shampoo. Filed Oct. 21, 1946 by Noramex Co., New York. Claims use since Aug. 20, 1946.

622—This in large, bold numerals for insect repellent liquid and cream. Filed Oct. 23, 1946 by Dodge & Olcott, Inc., New York. Claims use since July 9, 1946 on the liquid and since Aug. 5, 1946 on the cream form.

FENEX—This in upper case, medium letters for external insect repellent for animals. Filed Oct. 25, 1946 by Day Chemical Co., Newark, N. J. Claims use since Mar. 5, 1946.

NITROTAN — This in upper case, bold letters for liquid germicide. Filed Feb. 3, 1947 by Cramer Chemical Co., Gardner, Kans. Claims use since January, 1935.

ERUSTOMOTH—This in upper

Taylor to Wyandotte

Dr. A. Lloyd Taylor, formerly vice-president in charge of research and development for H. L. Shaw and Sons, Portsmouth, N. H., and Boston, Mass., has recently accepted a position as research supervisor in the Wyandotte Chemical Corp. research laboratories, Wyandotte, Mich. He will work on industrial detergents. Dr. Taylor has had many years' experience in this field both as director of research for Oakite Products Co., and as director of the Department of Chemistry, Pease Laboratories, New York.

Dr. A. Lloyd Taylor

Cleveland CSA Meeting

The Chemical Salesmen's Association of Cleveland held its regular monthly luncheon meeting August 4th at the Mid-Day Club and commemorated Coast Guard Anniversary Day according to a report by A. F. Smith, Westvaco Chlorine Products Corp., Cleveland, publicity chairman of the association. A film titled "Invasion of Iwo Jima" and a composite picture showing all the invasions of the second world war were shown through the courtesy of the Visual Education Department, U. S. Coast Guard.

DeWitt Thompson Dies

DeWitt Thompson, Heyden Chemical Corp., New York, died on Aug. 13th in New York. He was 42 years old. Mr. Thompson joined the sales staff of Heyden Chemical Corp. last year after 46 months' service in the Navy. A graduate of Columbia University, Mr. Thompson joined Mathieson Alkali Works, New York, and became manager of the company's consignment department. In 1939 he was named assistant general manager of sales. He is a former president of the Salesmen's Association of the American Chemical Industry.

Horizons, Inc., Moves

Horizons, Inc., Princeton, N. J., recently announced that its laboratory was moved from Niagara Falls, New York, to 2891 East 79th St., Cleveland. The new facilities were occupied on Sept. 1, 1947.

MACKENZIE DETERGENTS

Technical Grade Chemicals

1. Sodium Metasilicate-Pentahydrate.
2. Poly-Phos
   A Super Poly-Phosphate
3. Sodium Sulphate (Glauber's Salts)
   Anhydrous

Synthetic Soap Powders

1. SPRAY DRIED (Bead Form). Synthetic Organic Detergents with polyphosphates. A COMPLETE PRODUCT ready for packaging.
2. Granular (dense) Synthetic Organic Detergent for Wool Scouring and other industrial uses.

MIXED DETERGENTS

Metaplus	Mild general household cleaner for painted surfaces. No wiping or rinsing required.
Dishwashing Compound	(Pink or White) Built to government specifications for Machine Dishwashing.
Hand Dishwashing Compound	With or without special GERMICIDE. Requires no wiping. When germicide is included, dishes are sanitized. Germicide is non-toxic, odorless, and tasteless.
Streakless Car Wash	A new product for washing cars, buses, trucks, etc. Will not streak. No wiping necessary.
Concentrated Soap Powder	50% less water than regular soap powders. For laundries, institutions, launderettes, home laundering.
Driveway Cleaner	For cement or wood floors, grease pits, kitchen floors, meat packing plants, etc.

As basic manufacturers of cleaning chemicals, we have facilities for producing special cleansers for any particular purpose.

MACKENZIE LABORATORIES, Inc.

Front and Yarnall Streets, Chester, Pa.

case, bold letters for insecticides. Filed Feb. 24, 1947 by Pennsylvania Salt Mfg. Co. Philadelphia. Claims use since Dec. 31 1946.

MCP—This in upper case, reverse letters on an eight-sided figure for insecticides. Filed Mar. 10, 1947 by Mill Creek Products, Kansas City, Mo. Claims use since May 29, 1945.

SABANE—This in upper case, extra bold letters for insecticide. Filed Mar. 28, 1947 by Woolfolk Chemical Works, Ltd., Fort Valley, Ga. Claims use since Oct., 1946.

SANICOAT—This in upper and lower case, open letters for germicide, insecticide and deodorant. Filed Apr. 11, 1947 by Nutritional Products Co., Portland, Ore. Claims use since Aug. 1, 1945.

SAN PHENO — This in upper case, extra bold letters for disinfectant and germicide. Filed Apr. 15, 1947 by Huntington Laboratories, Inc., Huntington, Ind. Claims use since Dec. 15, 1931.

STEROX — This in upper case, bold letters for insecticides. Filed Apr. 15, 1947 by Monsanto Chemical Co., St. Louis. Claims use since Feb. 24, 1947.

BAITU — This in upper and lower case, extra bold, black letters for rodenticide. Filed Apr. 16, 1947 by Arthur Beck Co., Chicago. Claims use since Mar. 24, 1947.

OCTA-KLOR — This in upper case, bold, stencil letters for insecticides. Filed Apr. 16, 1947 by Julius Hyman & Co., Denver. Claims use since Mar. 15, 1947.

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Trade Marks Granted

428,069. Insect spray. Filed by Arrow Engineering & Chemical Co., Flint, Mich., July 14, 1945. Serial No. 485,809. Published Dec. 3, 1946. Class 6.

428,087. Tooth paste. Filed by Galen Laboratories, Pittsburgh, Nov. 1, 1945. Serial No. 490,884. Published Dec. 17, 1946. Class 6.

428, 099. Rust remover. Filed by Lanburn Chemical Co., Irvington, N. J., Dec. 15, 1945. Serial No. 493,-367. Published Dec. 17, 1946. Class 6.

428,112. Detergent. Filed by "Coffette" Products, Inc., Brooklyn, Jan. 29, 1946. Serial No. 495,586. Published Dec. 3, 1946. Class 6.

428,121. Insecticides. Filed by Heath Products Co., Bristol, Pa., Feb. 16, 1946. Serial No. 496,701. Published Dec. 17, 1946. Class 6.

428,127. Insecticides. Filed by U. N. Products Co., New York, Feb. 27, 1946. Serial No. 497,310. Published Dec. 17, 1946. Class 6.

428,138. Germicide and disinfectant. Filed by Ard Products Co., Chicago, Mar. 18, 1946. Serial No. 498,403. Published Dec. 3, 1946. Class 6.

428,171. Antiseptics. Filed by Peggy Breed, New York, Apr. 30, 1946. Serial No. 501,160. Published Dec. 10, 1946. Class 6.

428,247. Foam bath. Filed by Babs Creations, New York, Mar. 26, 1942. Serial No. 451,907. Published Jan. 12, 1943. Class 6.

428,277. Toilet soaps. Filed by Les Parfums de Dana, Inc., New York, Apr. 5, 1946. Serial No. 499,-719. Published Dec. 24, 1946. Class 4.

428,257. Dish-washing compound. Filed by Edw. Livingston & Sons, Kansas City, Mo., Oct. 15, 1945. Serial No. 489,972. Published Dec. 17, 1946. Class 4.

428,274. Metal cleaning compositions. Filed by United Chromium, Inc., New York, Mar. 27, 1946. Serial No. 499,089. Published Dec. 24, 1946. Class 4.

428,285. Metal cleaning preparation. Filed by Laundex Chemical Products Co., New York, Aug. 1, 1946. Serial No. 506,653. Published Dec. 24, 1946. Class 4.

428,462. Soap preparations. Filed by Gertrude R. Lee, Roxbury, Mass., Feb. 2, 1946. Serial No. 495,-893. Published Dec. 17, 1946. Class 4.

428,698. Shampoo. Filed by Mecos, Inc., New Orleans, La., Feb. 26, 1946. Serial No. 497,259. Published Dec. 31, 1946. Class 6.

Merrill Fifty Years with L. A. Soap

FRANK H. MERRILL, president and general manager of Los Angeles Soap Co., Los Angeles, celebrated,

FRANK H. MERRILL

on Sept. 1st, his fiftieth year with that firm. Two new products developed this year are now being marketed under the Merrill brand name in commemoration of the golden anniversary: "Merrill's Rich Suds," a detergent, and "Merrill's Fine Toilet Soap." Recently, Mr. Merrill was presented with an engraved document of esteem and appreciation by the company's board of directors.

A graduate of Mass. Institute of Technology, Mr. Merrill came to Los Angeles from Newburyport, Mass., on a glycerine recovery machinery installation job fifty years ago at a time when the company was starting out on a big expansion program.

Among Mr. Merrill's accomplishments while at L.A. Soap was the development of what is said to be the first granulated soap on the market, introduced as "White King Washing Soap" in 1920. Up until that time, most laundry soap, made with a tallow base, when used in the newer electric washing machines of the time had a tendency to curdle as the temperature of the water dropped below the boiling point. White King Washing Soap was formulated with regard to this fact and to do away with the troublesome curd. Mr. Merrill is credited by his associates with more "firsts" in the soap industry than any other individual.

BIDS AND AWARDS

P.O. Scouring Powder Bids

The following bids were received on 50,000 pounds of scouring powder in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C.: Pal Products Manufacturing Corp., Brooklyn, 3.9 cents, fob, N. Y. C.; 4.9 cents, fob Chicago; 3.9 cents, fob Brooklyn; 4.9 cents, fob Atlanta; 5.57 cents, fob Kansas City; 7.64 cents, fob San Francisco; Chemical Manufacturing & Distribution Co., Easton, Pa., 4.323 cents; Unity Sanitary Supply Co., New York, 5.5 cents; Wyandotte Chemicals Corp, Wyandotte, Mich.; $4.88 a drum, fob, New York; $4.75, fob Chicago; $5, fob Atlanta; $5.05, fob Kansas City, and $5.33, fob San Francisco, in 75 pound drums; Safford Co., Tryon, N. C., 3.3 cents; Imperial Products Co., Philadelphia, 2.16 cents,, fob Philadelphia; 2.6 cents, fob New York; 3.16 cents, fob Chicago; 3.54 cents, fob Atlanta; 3.78 cents, fob Kansas City; 4.28 cents, fob San Francisco; Margo Products Co., Chicago, 2.7 cents; Dorsett-Jones, Baltimore, 6.5 cents, fob Baltimore; 7.3 cents, fob New York; 7.7 cents, fob Chicago; 7.8 cents, fob Atlanta; 8.5 cents Kansas City and 11.2 cents, fob San Francisco.

In another Post Office opening, the following bids were received on 5,000 pounds of soap powder; Unity Sanitary Supply Co., New York, 6.25 cents a pound; Swift & Co., Chicago, 5.185 cents, fob East Cambridge, Mass., and 5.636 cents, fob Washington; Chemical Manufacturing & Distributing Co., Easton, Pa. 4.8 cents; Stevens Soap Corp., Brooklyn, 4.3 cents, fob Brooklyn and 4.85 cents, fob Washington; Standard Soap Co., of Camden, Camden, N. J., 15 cents a pound; Wolverine Chemicals Co., Grand Rapids, Mich., 9.58 cents; Lanair Chemical Corp., Chicago, 7.25 cents; Norcrest Products Co., New York, 6.67 cents; E. F. Drew & Co., New York, 5.5 cents; General Soap Co., Chicago, 5 cents; Dorsett-Jones, Baltimore, 8.9 cents, fob Baltimore and 9.5 cents, fob Washington; Tesco Chemicals, Atlanta, 4.35 cents, fob Atlanta and 5.35 cents, fob Washington; Armour & Co., Chicago, 4.6 cents, fob North Bergen, N. J., and 4.99 cents, fob Washington; Marman Soap Co., Milwaukee, 7.49 cents; Peck's Products Co., St. Louis, 4.25 cents; Kamen Soap Products, New York, 4.7 cents, fob Barberton, O.; Grace-Lee Products, Minneapolis, 7.5 cents and Old Dominion Paper Co., Norfolk, Va.; 5.24, fob Barberton, O.

Misc. Treasury Dept. Bids

In a recent opening for miscellaneous supplies by the Bureau of Federal Supply of the U. S. Treasury Department, the following bids were received on (item 1), 550 gallons of insecticide and (item 2), 180 gallons of insecticide: Pacific Chemical Co., Los Angeles, item 1, $2.99 for 350 gallons and item 2, $2.95 for 60 gallons; R. M. Hollingshead Corp., Camden, N. J., item 1, $2.55 and item 2, $2.40; Boyle-Midway, Inc., New York, item 1, $2.50 and item 2, $2.40; Cole Laboratories, Long Island City, N. Y., item 1, $2.50 for 360 gallons and item 2, $2.59 for 60 gallons; Michigan Chemical Corp., St. Louis, Mich., item 1, $2.10 for 360 gallons and item 2, $2.08 for 60 gallons, prices based on furnishing first emulsion concentrate formula; Eston Chemicals, Los Angeles, item 1, $2.75 for 360 gallons and item 2, $2.65 for 60 gallons; Dorsett-Jones, Baltimore, item 1, $2.203 for 360 gallons and item 2, $2.18 for 60 gallons; Capital Chemical Co., Washington, D. C., item 1, $2.26 for 360 gallons and item 2, $2.26 for 60 gallons; McCormick & Co., Baltimore, item 1, $2.61 for 360 gallons and item 2, $2.49 for 60 gallons.

In the same opening these bids were received on 750 containers of shoe polish: Whittemore Bros., Corp., Cambridge, Mass., 8 cents; General Wax Industries, Nashville, Tenn., 6 cents (2 ounces or over); Griffin Manufacturing Co., Brooklyn, 5.883 cents in 100-pound lots, 1¾ ounce containers; Boyer & Co., Philadelphia, 6.25 cents for 2 ¼ ounces and 8.3 cents for 3 3/3 ounces; American Products Co., Reidsville, N. C., 5 cents for 3½ ounces and Charles M. Hatcher Manufacturing Co., Philadelphia, 9 cents for 3 1/8 ounces.

Treasury Floor Wax Bids

Among the bids that were received on 12,000 pounds of wax floor polish in a recent opening for miscellaneous supplies by the Bureau of Federal Supply of the U. S. Treasury Department, Washington, D. C., were those of Trio Chemical Works, Brooklyn, 13.9 cents; Sherwin-Williams Co., Washington, D. C., 29 cents; International Metal Polish Co., Indianapolis, 29 cents; Wisconsin Chemical Products Co., Milwaukee, 22.5 cents (in 33 pound containers); Lasting Products Co., Baltimore, 15.5 cents; Selig Co., Atlanta, 32 cents; Twin City Shellac Co., Brooklyn, 15 cents; Oil Specialties & Refining Co., Brooklyn, 14.9 cents; Wilbert Products Co., New York, 20 cents; Penetone Co., Tenafly, N. J., 25.5 cents; Dorsett-Jones Co., Baltimore, 20.7 cents in 20 pound cans; Windsor Wax Co., Hoboken, N. J., 13.9 cents; Buckingham Wax Co., Long Island City, N. Y., 14.49 cents; Pur-All Paint Products Co., New York, 19 cents; Butcher Polish Co., Boston, 24 cents in 33 pound drums; Jones Products, Cambridge, Mass., 22 cents; Janitors Supply House, Baltimore, 22 cents; Bond Sanitary Products Co., York, Pa., 17.5 cents; Uncle Sam Chemical Co., New York, 16 cents; Boyle-Midway, Inc., New York, 21 cents.

P.O. Bronze Cleaner Bids

In a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., the following bids were received on 150 gallons of bronze cleaner: Dajan Chemical Co., South Boston, $1.50 per gallon; J. W. F. Corp., Buffalo, N. Y., $2.25; Moss Industries, Chemical Division, Brooklyn, $7.95.

RAW MATERIAL MARKETS

As of August 26, 1947

FACTORY production of fats and oils from domestic materials was about 10 per cent larger in the first half of 1947 than during the first six months of 1946, according to a recent report of the U. S. Department of Agriculture. Output of lard and tallow increased rather sharply during the first six months of this year, as did production of corn, peanut and soybean oils. Cottonseed oil production declined somewhat.

Tallow production, which the bureau of fats and oils of the USDA predicts will be larger in the second half of 1947 than in the comparable period of last year, may decline in 1948. Fewer cattle are anticipated on farms and ranches as a result of less corn being available for cattle feeding in the year beginning Oct. 1 than in the current season.

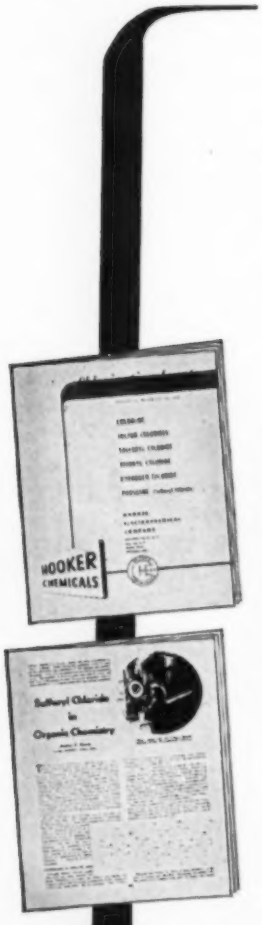
Imports of fats, oils and oilseeds in terms of oil will be larger in 1947 than the 966 million pounds imported in 1946. The total for the first five months of 1947 was 698 million pounds. The principal increases were in copra and tung oil.

Exports of fats, oils, fat and oil products, and oilseeds in terms of oil in 1947, including shipments to U. S. territories, totaled 366 million pounds in the first five months of 1947 compared with 436 million pounds in the first five months of 1946. Export allocations for the third quarter are less than last year. Export policy for the fourth quarter has not yet been determined.

Shipments of Philippine copra to the United States during July were more than double those of June, according to a recent announcement of the U. S. Department of Commerce. In July, the Philippines shipped 27,714 tons of copra, as against 11,570 tons for June. The increase in shipments to the United States during July follows a general trend established in the Islands following a slump recorded early in the second quarter of this year. It is now estimated, according to one observer, Thomas Hibben, advisor on economical development of the Office of International Trade, who recently returned from a four month visit to the Philippines, that the copra industry appears to have completely recovered from the war and its effects. He estimates that the 1947 shipments of copra from the Philippines will be 100

5 Types of Reactions you can carry out with Sulfuryl Chloride

1. **Chlorination of aromatic compounds**
2. **Chlorination of aliphatic compounds**
3. **Sulfonation of aliphatic compounds**
4. **Sulfonation of aromatic compounds**
5. **Acylation** (preparation of esters, acid chlorides, anhydrides, etc.)



Chlorination

Sulfuryl Chloride offers certain advantages as a chlorinating agent that are quite universally recognized. They are principally:

1. The heat of chlorination is far less than that using elementary chlorine.
2. It is possible by using different catalysts, reacting at different temperatures and by carefully controlling proportions of reactants, to chlorinate selectively.

Sulfonation

The availability of sulfur in the compound makes it equally valuable in the sulfonation of aromatics and aliphatics. Sulfonyl chloride derivatives may be obtained by the addition of small quantities of aluminum chloride to a cooled reaction mixture of sulfuryl chloride and aromatic hydrocarbons.

Formation of alkyl sulfonyl chlorides with yields as high as 70% are reported in the sulfonation of paraffin hydrocarbons in the presence of light and a catalyst.

Acylation

Alkyl chlorsulfonates are the products of reactions of sulfuryl chloride with many alipathic alcohols. A number of interesting acylated products may be produced through the reaction of this versatile chemical with aliphatic and aromatic amines.

* * *

You who are interested in the synthesis of organic chemicals will find Sulfuryl Chloride a valuable reagent. With Hooker Sulfuryl Chloride you will be working with a particularly pure product that tends to increase yield and eliminate side reactions.

For more information on Sulfuryl Chloride as a chlorinating agent write on your letterhead for Bulletin 328A. It also includes data on other Hooker chlorinating agents. For information concerning other reactions of Sulfuryl Chloride send for Bulletin 330, a reprint of an article on "Sulfuryl Chloride in Organic Chemistry." Technical Data Sheet 717 contains typical properties and specifications of Hooker Sulfuryl Chloride.

7-358

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HOOKER CHEMICALS

Caustic Soda Muriatic Acid Sodium Sulfide Paradichlorbenzene Chlorine Sodium Sulfhydrate

per cent higher than prewar. However, prewar production of coconut oil in the Islands has not been achieved as yet because of difficulty in replacing machinery that was damaged during the war. Mr. Hibben estimated that 1947 production of coconut oil in the Philippines would total 85,000 tons, of which 50,000 tons would be consumed locally.

Another copra development that took place during August was the announcement that because of the slump in the price of copra on the world markets the Copra Fund for East Indonesia would pay a "crisis allowance" of about $1.80 on each hundred kilogrammes of sundried and mixed copra delivered to the Copra Fund headquarters in East Indonesia. Prices in East Indonesia on copra have slumped to the point where it no longer pays to produce copra, it was stated. Total copra purchases for July registered half of the average of the previous months. The main cause being assigned to this condition is the high cost of living. During the first six months of 1947, 80,000 metric tons of copra were shipped abroad and a similar amount delivered to the oil-pressing industry in Indonesia by the Netherlands Indies Copra Fund, it was learned recently.

Moderate quantities of copra were purchased early in August at $140 a short ton, f.o.b. Philippine Islands, a reduction of $2 below the previous price.

Further price rises on alkalies were predicted recently as a result of increases in the costs of fuel, labor, steel, freight, etc. Increased prices of soda ash, chlorine, caustic soda and some other alkalies are expected to be announced around Oct. 1, according to informed sources. No indication as to the extent of the price advances has been indicated as yet, although some producers were reported as saying the increases might be substantial. Although soda ash deliveries in some instances have been made on a 24-hour basis, the material is still not in easy supply. Demand remains strong. The soap industry is said to have bought caustic soda more heavily in August than in July. It is understood that the gap between supply and demand on caustic is being lessened gradually, with a reduction of orders in arrears being a fairly good indication of what is taking place.

A last look at the fats and oils situation shows that total production from domestic fats and oils estimated for the crop year 1946-47 is up 158 million pounds from the previous (Department of Commerce) estimates, issued in July. However, total production estimated for 1947-48 is down 315 million pounds from the previous (May) estimate.

The downward trend in perfuming material prices continues through August, despite predictions that the continued decline is due for a break. Of 14 price changes reported in the perfuming materials field recently, all were downward, with no increases reported.

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FIFTH AND VAN WINKLE AVENUES — HAWTHORNE, N. J.

PRODUCTION SECTION

Perfuming your Soap

Package your perfumed soap as airtight as you can and avoid contact with unwrapped, assorted soaps

(Part III)

FOR THE past two months, articles on perfuming soaps have been featured in this section, dealing with both perfume and fixative problems. Dr. Paul Jellinek, studying perfuming problems in France, has examined the resistance to alkalies of several soap perfuming products and has reported on this in *Industrie de la Parfumerie*. His work, coming to us through the *Manufacturing Chemist* offers further information on the subjects previously discussed by Charles Morel and is presented as part three of this report on soap perfuming.

A white odorless soap containing 0.02 per cent free alkali was prepared, also a cocoanut-oil soap by the cold process method. These were perfumed as follows: When the perfume was liquid, 1 per cent was added to the soap paste. With solid perfumes, a 25 per cent solution in benzyl benzoate was prepared, 2 per cent of this solution being added to the soap, the percent of perfume being 0.5. Two tests were made with hot soap, two with cold soap. One of each was wrapped in waxed paper; the other was exposed to air and light. The results were as follows:

Alcohols

Citronella, geranium, and phenyl ethyl alcohol did not discolor the soap. The odor of the first two persisted for 18 months in wrapped soaps and 1 month in those left unwrapped. In the third, odor persisted intact in wrapped soaps and lasted for 2 weeks in exposed soap. Tertiary alcohols gave no color; odor was persistent in wrapped soaps but disappeared in 2-3 weeks in exposed soaps.

Aldehydes

These are generally very fugitive. For example anis-aldehyde in the presence of oxygen and light is transformed into the corresponding acids. In wrapped soaps the perfume persisted for 3 months, and disappeared in 4 days otherwise.

Ketones

With the four compositions studied, no change in color was noted. The odor persisted throughout the tests in wrapped soaps, but rapidly disappeared in exposed products. Ketones constitute ideal products for soap manufacture.

Esters

Practically all essential oils contain esters. In cold soap where perfume was introduced before complete saponification at a high temperature, the esters are partially saponified. Perfume did not keep well in hot soaps. Acetates, benzoates, cinnamates, and salicylates did not undergo any notable change.

Acids

Phenyl acetic acid is used in various formulae to give interesting effects. It completely lost its odor in a short time. Hot soap containing it became waxy in appearance but not colored. The use of acids is generally not recommended since they neutralize free alkali.

Phenols and Ether Phenolics

These rapidly altered the hue of soaps and the odor was modified and became disagreeable. Safrol, however, did not cause discoloration and retained its odor in all soaps.

The experiments pointed out that most synthetic perfumes are very volatile, and there is no relation between this property and their resistance to free alkalies. Where perfumes are resistant to alkalies, however, the loss of perfume is only superficial and reappears during washing or when the soap is cut. All soaps should be sealed as hermetically as possible. Contact with unwrapped assorted soaps should be avoided. *Manufacturing Chemist 18*, 253 (1947).

◆

Sulfamic Acid Derivatives

Fatty acid amides are caused to react with formaldehyde and sulfamic acid to give products which are wetting agents and detergents. Soc. pour l'ind. chim. a Bale, British Patent No. 584,914; through *Chem. Abs.*

◆

Stabilizing Fats and Oils

Treating with small quantities of selenium is recommended, just enough to eliminate metals and metal compounds but not enough to occasion elaidinizing. N. V. Ned. Research Centrale, Dutch Patent No. 55,811; through *Chem. Abs.*

Continuous Soapmaking

THE continuous soapmaking process, developed during the last decade by Procter & Gamble Company, converting raw material to finished product in a matter of hours employs countercurrent hydrolysis under pressure in the presence of a catalyst, which is followed by continuous distillation, neutralization, and finishing.

The mixture of fats in the proper proportions for whatever soap is being made, reacts with water to split into fatty acid and glycerine. The fatty acid is purified by distillation and is then neutralized. The resulting neat soap may be finished into any of the usual products. By-product glycerine is concentrated in a multiple-effect evaporator which is synchronized with the fatty-acid production.

The largest dollar advantage in the process is in the improved color of soap made from a crude fat, or the ability to produce a desired color of soap from a darker crude fat without extensive pretreatment. Improved glycerine recovery is also significant.

Fatty acid is neutralized by mixing with a proportioned quantity of caustic soda solution in a high-speed mixer. When desired, the soap may be made just as easily, using mixed lyes such as caustic potash and caustic soda, in order to improve solubility. The moisture content of the resulting soap is predetermined by making up the proper caustic concentration. Salt is added to the caustic soda to secure a neat soap with the usual electrolyte content and properties.

Soap from the fatty-acid neutralizer is discharged at 200° F, into a blending tank holding about 1 hour's production. This tank has a vertically mounted worm which slowly mixes the product and assures uniform composition. The soap is checked by the operator from time to time to hold it within the conventional limits of free caustic, usually 0.02-0.1 per cent of Na_2O. The salt content at this point is about 0.3-0.6 per cent, and the water about 30 per cent. Conventional soap finishing may follow by pumping to the crutchers and frames, or to the milled or flake soap departments, or to spray drying towers.

To make white floating soap, neat soap from the storage tank is put under 700 pounds per square inch pressure by a piston pump. While under pressure the soap is heated to about 400° F. in a high-pressure steam heat exchanger. After the soap leaves the heat exchanger the pressure is released. The soap sprays into a flash tank where partial drying takes place to about the 20 per cent moisture content desired in the finished product.

Passing to a cooling machine, the chilled soap is mixed and scraped from a cylindrical cooling wall. Air is introduced and the soap cooled from 220° F. to 150°, when it becomes a plastic solid which can be extruded in strip form. After being cut into 3-bar lengths, the strips are gently loaded onto trays by a vacuum pickup device. The trays of soap are loaded onto trucks where they are cooled to room temperature, ready for cutting, stamping, and wrapping. G. W. McBride, *Chem. Engineering 54*, No. 4, 94-7 (1947).

Fungi in Cosmetics

The infection of cosmetic emulsions and creams by fungi is always a possibility, the usual source being the sealers of the jar caps. The fungi most apt to be troublesome are of the type of *M. alternaria*, which are not dangerous in themselves, but which can destroy both perfume and appearance. The only safe procedure is constant control. C. Holt and G. Carroll, *Soap, Perfumery, Cosmetics 20*, 566-7 (1947).

◆

Glycerine from Sugar

Catalytic production of glycerine from cheap sugars by hydrogenation is one of the processes carried on at the I. G. Farbenindustrie A.G. plant. The product is filtered, cleared with charcoal, and dried under a vacuum. It consists of 40 per cent glycerine, 40 per cent propylene glycol, and 20 per cent hexahydric alcohol. This was used as a substitute for glycerine where its physical properties were suitable. *The Chem. Age 56*, 601 (1947).

◆

Aluminum Dilaurate

Ordinary soaps in water are the best known examples of association colloids. In them, ions and molecules associate spontaneously to form colloidal particles or micelles, and these micelles are in true reversible equilibrium with the ions and molecules from which they form. The particle weight or apparent molecular weight of such colloids is a function of concentration and temperature. Aluminum dilaurate, $Al(OH)L_2$, in benzene appears to form a similar association colloid, as shown by osmotic pressure and viscosity measurements. J. W. McBain and E. B. Working, *J. Phys. & Colloid Chem. 51*, 974-80 (1947).

Soybean Chlorophyll

The chlorophyll content of soybean oil, both hardened and unhardened, can be determined by a spectrophotometric procedure. The influence of refining, hydrogenation, and deodorization on chlorophyll content has been reviewed. Isotherms are presented which illustrate the complexity in bleaching soybean oil with respect to chlorophyll. W. C. Pritchett, W. G. Taylor, and D. M. Carroll, *J. Am. Oil Chemists' Soc. 24*, 225-7 (1947).

◆

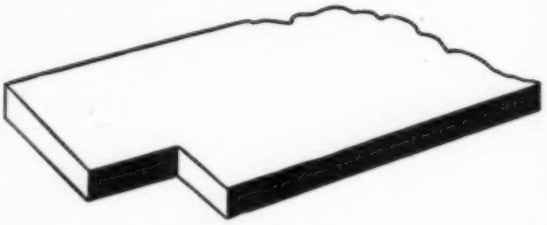
Textile Agents

Condensation products of high molecular weight of aromatic hydrocarbons such as benzene or naphthalene, and acetylene, on sulfonation, give foaming and wetting agents for textile baths. N. V. de Bataafsche Petroleum Maatschappij. Dutch Patent No. 56,539.

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Nebraska*



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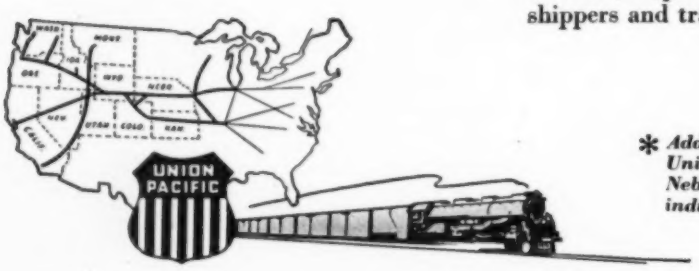

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UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

Study Optimum Concentration of Soap

A DIFFICULTY in carrying over laboratory washing results to commercial practice is that the dirt to detergent ratio is commonly much higher in commercial washing than in laboratory washing. In experiments to determine the value of this ratio, it was found to be 7 in the laundry scouring of heavily soiled goods such as overalls. Since it would seem fair to compare detergents on the absolute amount of standard dirt removed per unit weight of detergent, this is a major difficulty in comparing laboratory and commercial results.

The optimum concentration of soap for washing is 0.15-0.2 per cent, but this concentration cannot maintain in suspension the amount of dirt represented by a dirt to detergent ratio of 7. Under conditions of heavy soiling in the laundry, soap concentration may need to be raised to 0.5 per cent.

When washing experiments were carried out with standard soiled swatches, and varying concentrations of soap, a minimum of washing ability was found at 0.08 per cent of soap, calculated to an anhydrous basis. At concentrations higher than the point of minimum detergent action, detergent ability rises rapidly up to a concentration of 0.16 per cent soap, beyond which no improvement occurred.

The region of concentration of maximum hydrolysis coincides, qualitatively at least, with the region of concentration of minimum detergent power. At maximum hydrolysis, acid soaps are formed which will precipitate and be adsorbed by the fabric being washed. This explains some of the difficulties of rinsing, accompanied by redeposition, and also the improvement caused by alkaline addition to suppress hydrolysis. K. Tomlinson, *J. Soc. Dyers & Col. 63*, 107-9 (1947).

Mill Floor Cleaning

Unclean floors bear a definite relationship to mill-operating costs. This applies particularly to traffic areas where oil or grease are spilled or permitted to leak from bearings. Boxes or trucks running over oil spots will cause the grease to become packed until it forms a coating which requires a major cleaning and refinishing job.

Periodic cleaning of the floors, especially much used floors, with a hot alkaline solution applied with a brush or mop, is usually sufficient. The solution may have to soak in for a while if a coating has been allowed to build up. A granular oil absorbent spread on the floor helps take up the oil and keep it from being tracked and spread about. *Textile World 97*, No. 4, 130 (1947).

Bleach Slurries

Bleach-water slurries which set at a temperature above 0° C. are particularly liable to give trouble in certain forms of apparatus. On cooling, slurries of some ordinary bleaching powders and stabilized products set to a pasty or gelatinous mass at temperatures above freezing. Setting was apparently connected with high calcium hydroxide content in the presence of considerable calcium chloride. Some high-test bleach-water mixtures set on mixing at room temperature. Setting was apparently due to the hydration of calcium hypochlorite. Sucrose proved to be a good antisetting substance. S. Love and J. Goldenson, *Chem Corps J. 1*, 39-50 (1947).

Oil Extraction

Crude cottonseed oils were produced on a pilot-plant scale from a single lot of prime cottonseed by hexane extraction of the cooked and uncooked meats and by standard hydraulic pressing of the cooked meats. Refining and bleached color tests showed that the crude oil obtained by solvent extraction of either the cooked or uncooked meats with removal of solvent below 140° F. compared favorably in quality with the oil prepared by hydraulic pressing. The lightest bleached oils were obtained from the oil produced by solvent extraction of the uncooked meats. The solvent-extracted oils appeared to refine better and still give comparable color and refining tests. E. L. D'Aquin, J. P. Spadaro, H. L. E. Xix, J. Pominshi, L. J. Molaison, and E. F. Pollard, *Oil Mill Gaz. 51*, No. 10, 17-19 (1947).

Silica Determination

In a new method for the rapid determination of silica in soaps and soap flakes, these are decomposed by nitric-perchloric acids, with the aid of a catalyst. Silica is then dehydrated, filtered, and determined in the usual gravimetric manner. L. Silverman, *Soap, Perfumery, Cosmetics 20*, 557-8 (1947).

Dehydrochlorination

Catalytic vapor-phase dehydrochlorination at pressures below 1.5 mm. and at 220-350° C., was applied to chlorination products of methyl palmitate, palmitic, stearic, oleic, and linoleic acids. Clear, pale desaturated products were recovered from each material. Tests of the desaturated product from dichlorinated palmitic acid indicated that solution of its sodium soap are good detergents with better than average wetting and foaming powers. Washing tests with soap of the desaturated product showed that its detergent efficiency was 8-9 per cent greater than that of a soap of cocoanut-oil acids. G. R. Van Atta, D. F. Houston and W. C. Dietrich, *J. Am. Oil Chemists' Soc. 24*, 209-12 (1947).

Soap Mixture

Alkali-free soap is mixed with a silicic acid sol that shows no acid reaction when gelatinized and causes the mixture to gel. Salts are added and the mass is kneaded. N. V. J. H. Wigleven, Dutch Patent No. 56,339; through *Chem. Abs.*

Metal Soaps

Insoluble metal soaps are made by emulsifying a salt of aluminum, copper, or cadmium, in an alkali soap solution of a solvent or dispersing agent for the metal soap. L. Z. Olsson, Swedish Patent No. 100,192.

PRODUCTION *Clinic*

By DR. E. G. THOMSSEN, Ph.D.

OFTEN the simplest operations are overlooked, merely because we consider them as inconsequential. In a discussion not so long ago with a group of production heads, our conversation dwelt upon these simpler factory operations. Many of these men had become so engrossed with the more complex manufacturing problems that the less difficult, easier problems were overlooked. With labor costs becoming an increasing part of total costs, short cuts in labor saving from every angle are currently a more potent part of the production manager's duties. It is just as important to economize on simple operations as it is with the more intricate ones. While it is true that labor costs reepresent a much smaller item in the soap and sanitary chemical field than in many other industries, it is a fact that the percentage of labor cost to raw material costs has been steadily on the up grade.

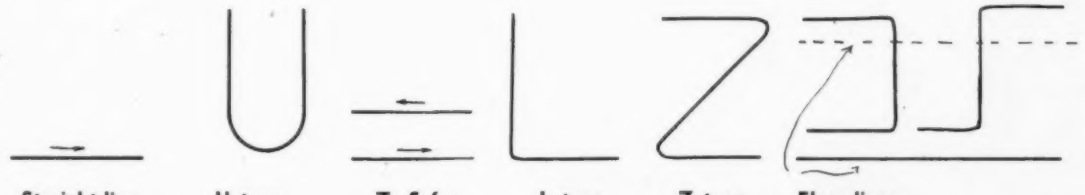
One of the important means by which labor costs can be materially cut is through the proper use of conveying

systems. While much other equipment is still hard to get, conveyors are not so tight and it is a good time to look toward the re-arrangement of operations by the use of this equipment.

The term "straight line production" is heard so often in production circles that one is very apt to lose sight of other and better than straight line production methods. This applies especially to conveyor layouts. While it is true that a straight line is the shortest distance between two points, it is not true that such a line is unfixedly the most economical in all plant designs. In the handling of goods with conveyors, other configurations often work out better. A manufacturing plant is a three dimensional figure and in addition to length, which usually is in mind when "straight line" operations are considered, a plant possesses width and height. Proper layout of any plant does not disregard these other two dimensions.

In this regard, it is apropos to consider the arrangement of conveyors in other forms than as a straight line. We will disregard, in our discussion, the types of conveyors themselves as there are so great a variety of them that this is a subject all by itself. We will also eliminate the question of use of trucks of various kinds though those are quite generally used in conjunction with conveying operations.

One of the most common objections to straight line type conveyors is attributed to their length. When numerous pieces of machinery like an unscrambler, cleaner, filler, capper, labeler, case sealer, etc., are used in such an arrangement, traffic difficulties arise. Long lines interfere with cross traffic on the floor of the building when they are installed. A bridge or stile over such a conveyor overcomes foot travel around it, but trucks or other loads must pass around the ends of the lines. Time is also lost through shifting workers from one operation to another. Another objection is that it is necessary to have attendants at both ends of such a line and it is not always possible to keep them busy as is the case with a U type or "to and fro" layout when one employee can



CONVEYOR ARRANGEMENTS

work at both ends of the conveyor. As bottles, cans and jars now come in reshippers, it is also necessary to get the empty cases to the other end of the straight line. This may be done by trucking or an overhead conveyor on a straight production line it is true. In both cases, however, time is lost in getting these to the proper filling point.

AMONG the improved layouts for conveyors are arrangements like those in the accompanying figure. These layouts shorten up lines and operate through two floors either moving goods upward or downward.

Of these arrangements the "U type" layout has several advantages over the straight line. By having both ends of this conveyor system close together, it is possible, as already stated, to use labor more economically. This often means one or two less attendants on the conveyor line. If desirable, a short piece of conveyor can be used to connect the two ends and thus quickly get rid of reshipping cartons. When various pieces of packaging machinery are located along the conveyor, an attendant stationed in the middle (and one is always required even with fully automatic equipment) is closer to these various pieces of machinery in case of trouble, and he can keep his eye on these more readily than if they are strung out in a long line. The U-shape also overcomes the objection of length by using width ~s a floor as well as length. This U arrangement can be turned on edge, so as to say, and carry operations through two floors by using a lifting or lowering conveyor. At times this is of decided advantage. It makes possible filling operations on one floor and packaging on another. In short buildings, buildings with busy or no elevators, or where stock rooms are a consideration, this often is of decided value in getting the goods near the stock or shipping room.

A variation of the "U" layout is the "to and fro" arrangement. In this case two belts move in opposite directions. It is of value particularly for cooling packaged goods or where semi-automatic machinery is used and the operator picks a package off the belt for labeling.

The "L" and "Z" types of arrangements are less frequently used. Their main object is to shorten a production line or to get around some obstruction like pillars or shafts which are frequently found in the way. These too can be stood on edge to work through two floors. This is especially true of the "Z" configuration.

WHILE not actually a conveyor in the true sense of the word, the carousel or circular type of production is worthy of comment. This slowly-revolving table may be circular, a hexagon, octagon, or other poly-sided figure. In printing plants for assembling calendars, for example, twelve sides, one for each month, are used. The dimensions are of suitable size. Such an arrangement is of utility in assembling packages made up of several parts. At times variable speeds are used to drive such a table and a bonus for production is possible.

Conveyors when properly arranged result in much labor saving and more rapid production. In larger plants complicated lines may be built to facilitate the continuous moving of many types of goods from the forward stock rooms directly to finished stores, the shipping room, or directly into cars or trucks. Production men who are interested in labor saving are giving attention to conveying systems at this time.

Featured Chemicals

IT IS encouraging to read more items in newspapers than in previous years regarding new chemicals. Most laymen do not have access to the scientific literature and even those who do often miss items of interest. In glancing through the daily newspapers recently we found four chemicals featured that are of interest to our industries. These are the herbicide isopropyl-n-phenyl carbamate, shortened to "IPC," a carnauba-like wax from sugar cane, propyl gallate as a fat antioxidant and research work on "Toxaphene." The information regarding these chemicals is of sufficient interest to repeat even though some of our readers may have seen the press or scientific releases.

IPC which is attracting considerable attention for the control of weedy grasses like quack grass was investigated by Mitchell and Marth* of the Bureau of Plant Industry, at Beltsville, Maryland. The compound is made by the J. T. Baker Chemical Company, Phillipsburgh, N. J. Preliminary greenhouse experiments indicate that IPC may be useful to control certain of the weedy grasses without checking the growth of vegetables and other crops.

The U. S. Department of Agriculture chemists have developed the promising method of obtaining a wax similar to carnauba wax from sugarcane press cake. This press cake when dried contains about 10% wax. The wax first is extracted by various common solvents to obtain a crude wax. Acetone is then used as a second solvent to remove undesirable fatty materials. Alcohol is finally used to obtain the pure wax. About 5% of suitable wax results. Pilot plant production is being carried out by the Department. [Edit. Note: See Aug. issue P. 167 for more on this.]

While there are many antioxidants known for preserving fats and oils, they are limited in use, too expensive or not suitable for edible products. The Heyden Chemical Corporation recently announced that propyl gallate in the proportion of 0.01% is to be added to lard to keep it fresh for a longer period. This chemical has been used for some time in animal feeding oils like poultry cod liver oil before being approved for human consumption by the Federal Security Agency. It is said to be an anti-oxidant of high activity and non-deleterious to health in the small quantity used.

In informing the public regarding the continuation of the $10,000.00 fellowship at University of Delaware's Department of Entomology, Hercules Powder Company gives further information on "Toxaphene." Preliminary tests indicate it is as toxic as DDT for potato leafhoppers and as effective as rotenone for the Mexican bean

*See *Science* Vol.106, No.2740 (July 4, 1947), p.15

beetle, as well as promising for control of the codling moth. These applications are in addition to the wide variety of insects it already is known to control.

Handy Strainer

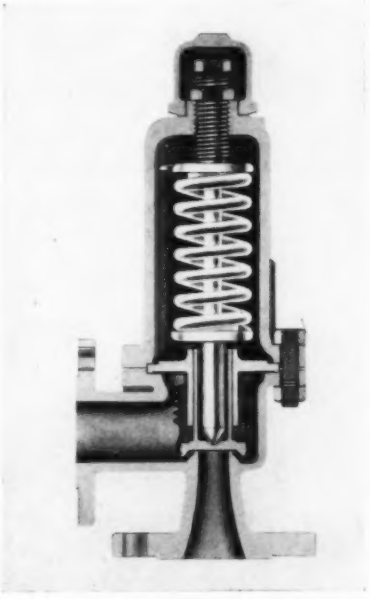
A useful valve strainer for use in pipelines where it is advantageous to have an uninterrupted, continuous flow has been developed by the J. A. Zurn Manufacturing Company, Erie, Pa. The pipe fixture, which is flanged, consists of two strainers. By diverting the flow of the liquid from one strainer to the other by the use of one non-freezing valve, one strainer may be cleaned while the other is operating. The strainer comes in sizes from one inch to six inches and will operate up to 300 psi.

New Nickel Handbook

A new handbook and guide titled "Nickel and High Nickel Alloys" is being distributed by the International Nickel Co., New York. In addition to information on nickel, monel, "Inconel" and associated alloys, it also includes material on such other alloys as the Hastelloys and Ilium, and reports on properties, heat and corrosion resistance as well as on modern fabrication and finishing practices. The handbook was prepared by Dr. Norman E. Woldman, consulting metallurgical engineer.

Catalog on Open Heaters

A new 20-page catalog, No. 4091, describing three lines of open heaters for direct-contact heating of boiler feed and industrial process waters with available exhaust or live steam, was recently published by Cochrane Corp., Philadelphia, water conditioning and steam equipment manufacturer. The catalog describes the characteristics of the various direct contact open heater designs and accessories, showing actual installation photographs and flow diagrams together with supplemental data. Information on a new condensate return system for high differential service from presses, driers and other steam-heat process equipment is also available from the company. The unit provides for the return of low-pressure condensate direct to boilers in the 100 to 150 psi range. For example, a standard 5 HP unit will handle 15 gpm at 50 psi differential, whereas the 5 HP Cochrane condensate return system will handle the same quantity at 150 psi differential.



Pictured here is the new acid resistant safety and relief valve recently introduced by Farris Engineering Corp., Palisades Park, N. J. Two features of the new valve are (1) use of "Hastelloy-C" for the nozzle and valve disc, and in certain models, for the entire valve body; and (2) the complete isolation of all working parts of the valve behind a vapor proof "FarriSeal" curtain. It is available with flange connections in sizes from ½ inch to 2 inches, and with screwed connections in sizes from ½ to one inch.

Prentiss Issues BHC Folder

An eight-page folder giving a short resume of the advantages and limitations of benzene hexachloride was recently released by R. J. Prentiss & Co., New York. The booklet includes a summary of the large volume of field work done to date in tabular form, showing insects, applications, and results.

Offers New Intermediate

The commercial production of vinyl cyclohexene, a compound heretofore available only in laboratory quantities, was announced late in July by the chemical division, Koppers Co., Pittsburgh. Although applications thus far are only in the development stage, the material offers interesting possibilities as an intermediate for the production of a number of synthetic organic chemicals. The chemical structure of this unconjugated diolefinic hydrocarbon indicates that it can enter into a wide variety of chemical reactions. The two isolated double bonds offer interesting possibilities as points of attack for further chemical reactions. Vinyl cyclohexene does not polymerize readily and therefore may be stored under normal conditions. The commercial product contains no inhibitor.

New Booklet on Waxes

A new booklet entitled, "Natural Waxes, Synthetic Waxes, and Special Compounds," was recently released describing the various wax products manufactured by General Wax Refining Co., New York and distributed by Cornelius Products Co., New York. The booklet offers a general discussion of the character and uses of the company's various synthetic waxes and wax compounds, and includes two useful tables. The first offers data on melting point, hardness, color, acid value, saponification value, and suggested uses for 31 of the company's various wax products. The second table offers solubility data on 15 of the company's products. A discussion of the production of emulsion wax polishes using "Emulsowax" is a feature of the new booklet which also includes some 15 formulas as well as instructions on the preparation of shellac solution for emulsion wax polishes.

New Book on Tank Data

A new book offering depth gauge tables for tanks with flat ends was recently published by William Fogle, publisher of boiler pressure vessel and tank handbooks and tank calibration tables, 2412 N. Beachwood Drive, Los Angeles 28, Calif. The book shows the volume in U. S. gallons at each inch of depth for the entire tank, and for each lineal inch and foot of horizontal cylindrical liquid storage tanks with flat ends, ranging from 12 to 144 inches in diameter and from 2 to 40 feet in length. The price is five dollars per copy.

SYNTHETIC DETERGENTS

R N-WATER SOFTENER A

PROPERTIES

Clear, colorless, odorless aqueous solution (density—1.21).

COMPOSITION

An aromatic polyaminocarboxylic acid salt.

USES

When used in combination with fatty acid soaps and certain synthetic detergents this organic type lime soap dispersant and solubilizer enhances foaming and detergency properties, inhibits flocculation in hard water and improves rinsing. Many types of liquid shampoos and various concentrated soap solutions are clarified on addition of this product.

RICHES-NELSON, INC.

Chemicals and Allied Products

342 MADISON AVENUE · NEW YORK 17, N.Y.

Package Filler

A 4-page circular in color was recently released by Stuyvesant Engineering Co., Lyndhurst, N. J., describing their new package-filling machine, the "Fillmaster," models "204," "205," and "206." The Fillmaster features a conical hopper from which the material is fed into tubular measures in the intermittently rotating top dial. Each filled measure is guided around to the dial in the front of the machine where a circular opening permits the product to be discharged into a container held there by the operator. With additional interchangeable parts any one of the Fillmaster models can be easily and quickly changed over to fill containers of larger or smaller capacity. A range of from a fraction of a gram to five pounds is said to be obtainable.

New Catalog on Lithcote

A new brochure on protective coatings and linings for steel and other metals was recently made available by Lithgow Corp., Chicago. Described in this illustrated, 8-page catalog are a wide range of "Lithcote" applications. Lithcote is a baked-on synthetic resin coating resistant to acids, solvents, brines, alcohols, fats and oils, and petroleum. Results of suspending Lithcote strips of mild steel at room temperature in various solutions are shown.

New Packaging Medium

A new type of packaging medium was recently announced by Sherman Paper Products Corp., Newton Upper Falls, Mass., marketed under the name of "Corroflex Tube-Tainer." Described as a "cushioned container in continuous roll," Corroflex is a flexible-corrugated cushion packing material. It is supplied in stock rolls 250 feet long in a variety of widths. Any standard closure may be used with the "Tube-Tainer."

Sanitation Course Folder

A course on controlled industrial sanitation is explained in an 8-page booklet prepared and presented by Industrial Sanitation Counselors, division of Chemco Co., Louisville. Courses range from one to five days depending on the total time devoted to the entire conference and the particular need for treatment of the subject. Controlled industrial sanitation courses are given right at the plant and problems relating to the specific plant set-up are featured.

Milkstone Remover Leaflet

A six-page leaflet describing its new milk stone remover "Pennclean" and giving directions for its use was recently published by the B-K division of Pennsylvania Salt Mfg. Co., Philadelphia. The leaflet describes the product, the nature of milkstone and how Pennclean should be used to remove milkstone, casein, and dried-on milk deposits from dairy utensils, flash pasteurizers and milking machines.

Revised Trademark Rules

Revised rules and regulations relating to the registration of trademarks and to general practice before the patent office under the Lanham Trademark Act was recently published by the U. S. Patent Office. Copies of the revised rules may be obtained from the Commissioner of Patents, Room 1098-C, Department of Commerce, Washington 25, D. C.

Booklet on Ceylon Copra

An address titled "The Costs of Production of Cocoanut Oil and Copra in Ceylon" by Dr. Reginald Child, director, Cocoanut Research Scheme, made before the Ceylon Economic Society in November 1946, is now available in booklet form. The paper was originally published in the *Ceylon Economic Journal*. Copies may be obtained from Cocoanut Research Scheme, Colombo, Ceylon.

New Folder on Pumps

A new folder on pumps was recently released by the Bump Pump Co., LaCrosse, Wisc. The folder offers information on the Bump pump principle of operation, ranges of sizes of Bump sanitary and industrial pumps and pictures a number of the company's direct drive, v-belt driven and variable speed coupled pumps.

TGA Spermaceti Standard

The Toilet Goods Association, Inc., New York, issued August 5th a new proposed standard for spermaceti which went into effect on September 5th after suggestions from the industry had been considered. The new TGA standard defines spermaceti as a white, slightly unctuous, waxy substance, having a pearly lustre and crystalline fracture, obtained from the head of the sperm whale: *Physeter macrocephalus Linne* (*Fam. Physeteridae*). According to the standard, spermaceti should possess a very faint characteristic odor with no suggestion of rancidity and should be soluble in ether, chloroform and boiling ethanol. Its melting point should range from 44°C. to 50°C. (method—USP XIII, P. 667) and it should meet test requirements with regard to paraffin and free acids (method—USP XIII P. 512). Saponification value should range from 124 to 129 (method—USP XIII, P. 647) and iodine value should be no greater than 3.5 (method—Hanus—USP XIII, P. 647). The acid number should be no greater than 0.1 as determined by a method presented in the TGA standard.

Pressure Indicator Bulletin

Barton Instrument Co., Los Angeles, recently released Bulletin 181-1 describing their new "Model 181" differential pressure indicator for the measurement of flow, liquid level, and pressure differential. Model 181 features a 6-inch dial for easier visibility; wide differential pressure range (0-50 inches of water up to 0-200 psi.); universal mounting and improved vapor-proof case. Static pressure readings extend up to 3000 psi.

BHC Publications Listed

A list of 240 publications on benzene hexachloride, prepared by Ruth L. Busbey, division of insecticide investigations, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture, was released late in July. Reprints of the publications, as well as the bibliography, are available for distribution by the Bureau.

PRODUCTS AND PROCESSES

Detergent Briquets

Detergent briquets suitable for use in modern machines for washing dishes, milk cans, and the like, may be compounded from 2-50 per cent of sodium tripolyphosphate, 10-60 of of trisodium phosphate or soda ash or both, 30-50 of water, and 1-15 per cent of sodium silicate. The alkalinity should be equal to that of metasilicate or higher. Various surface-active agents capable of withstanding 80-100° C. in an alkaline environment may be included in a proportion up to 5 per cent, to enhance the cleansing action and to improve rinsing. Addition of such substances slows down the rate of solution of the briquets. The briquets are hard, strong, and physically stable. They do not disintegrate under normal conditions of use, and have a uniform solubility rate. No chemical change occurs on storage. J. D. MacMahon, to The Mathieson Alkali Works, Inc. U. S. Patent No. 2,412,819.

Hand Cleaner

A noninjurious hand cleaner which may be used alone without wash water consists of an aqueous emulsion of stearic acid and a bland vegetable or mineral oil in a solution of an ethylene glycol stearate soap and an ethylene glycol laurate soap. The emulsion is stabilized by the presence of ethylene glycol or glycerol. W. E. Kleinicke, to The Johnson-March Corp. U. S. Patent No. 2,410,168.

Phosphoric Acid Detergent

A cleaner containing 1-5 per cent of orthophosphoric acid, 0.03-1 per cent of alkyl phenyl glycol ether sulfonate emulsion, and 0.002-0.02 per cent of triamylamine, is effective in removing various sorts of soil or scale with minimum injury to the exposed or underlying metal, and in removing oil, dirt, and smoke from painted or lacquered surfaces without injury to the finish coat. The cleaner rinses freely from the surface after cleansing and requires no additions of such substances as glue, molasses, or glucose. The sulfonate compound is a wetting agent, the triamine a synergist. C. P. Given, to Virginia-Carolina Chem. Corp. U. S. Patent No. 2,413,495.

Composition for Laundry

A laundry composition to be used in the break consists of 25-40 per cent of an alkali metal subsilicate, 25-75 of bentonite, at least 5 of an alkali metal phosphate, and 5-25 per cent of a fatty acid oil. Saponification occurs when the composition is added to water, thus producing a greater cleaning effect. E. W. Garverich and W. L. Martin, to The Pennsylvania Salt Mfg. Co. U. S. Patent No. 2,411,090.

Barrier Creams

Barrier Creams, or preparations to prevent industrial dermatitis, have assumed an increasingly important role in recent years. Suggested formulas are as follows:

	1	2
Lanolin	100	10
Paraffin wax	30	—
Liquid paraffin	35	—
Diethylene glycol monostearate	60	95
Distilled water	275	360
Dextrin	—	20
Glycol bori-borate	—	15

The emulsifying agent is one of the newer synthetic products and is self-emulsifying. The second formula is especially suitable for protecting the hands of workers in contact with greases and lacquers. *Perfumery & Essen. Oil Record 38*, 178-81 (1947).

New Scouring Agent

A new scouring agent, "Oridex D," is a blend of the potassium salts of sulfated amide condensation products of straight-chain acids. Stock solutions of 5-20 per cent are easily prepared with warm water. The compound shows no precipitation in the hardest waters and no more of it is required for washing in hard water than in soft water. M. Mytelka, *Rayon Textile Mo. 28*, 293 (1947).

Monochloramine Deodorant

An aqueous solution of monochloramine is recommended as a deodorant for use in refrigerating chambers to eliminate the characteristic and persistent smell of such store rooms. The concentration should be 10 parts per 1,000,000 of water. When sprayed with an ordinary pump, it is said to deodorize the establishment by its complete disruption of the organic material mainly responsible for the smell. Monochloramine is tasteless and odorless. It can be made by mixing ammonia vapor with water containing free chlorine. *Manufacturing Chemist 18*, 248 (1947).

Water Softener

A water-softening agent for use in association with alkali metal fatty-acid soaps comprises an alkali metal salt of an aliphatic amino polycarboxylic acid, such as the acid trisodium salt of ethylene diamine tetracarboxylic acid. From 5 to 25 per cent of the softening agent, based on the weight of soap, should be added, depending on the hardness of the water. F. C. Bersworth. U. S. Patent No. 2,412,943.

Cleansing Powder

A dry cleansing powder consists of a major proportion of sawdust, bran, or oatmeal, or other similar fibrous material, and a minor proportion of soap, an alkali "per" salt, such as sodium perborate, and alkali carbonate such as soda ash. W. Ruguschanski. British Patent No. 569,022.

Detergent Compositions

Hard water detergents may be formed from the reaction of compounds such as ethylene diamine tetracarboxylic acid and stearic acid, or the reaction of glycerol and an alkali metal salt of an amino polyacetic acid. F. C. Bersworth, U. S. Patents 2,412,944, and 2,412,945.

No. 594Q
SCREW CAP

A Leakproof Container that can be depended upon for safety in shipping

INLAND STEEL CONTAINERS

Container No. 594Q is designed for shipping thin liquids. Unusual strength is provided by the five thickness chime made with the double seaming method of attaching head and bottom. The thinnest of liquids can be safely shipped in this drum type container that stays leakproof even with rough handling. Three styles of openings can be furnished—

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No. 594R
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For EASY HANDLING and POSITIVE RESULTS

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Engineered in every detail to provide maximum efficiency on your toughest filtering job. It is completely enclosed and air-tight preventing leakage or evaporation, yet permits quick, easy dismantling for cleaning. Compactness and extreme portability assures convenience and speed in handling batch filtration work in different locations. For a dependable filtration system with low operating and maintenance cost, use an Alsop *"Sealed-Disc"* Filter. Recommended for liquid soaps, chemicals, perfumes, cosmetic preparations, alcohol, water, etc. Sizes with or without pumps, from 1 g.p.m. to many thousands of g.p.h. Our bulletin #745 gives complete details, we'll gladly send you a copy.

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"Sealed-Disc" Filters are available in Stainless Steel, Monel Metal or Nickel Plated Brass and Bronze at surprisingly low cost.

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NEW PATENTS

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Registered Attorneys

PATENT AND TRADE MARK CAUSES

402 Bowen Building, Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel. Any inquiries relating to Patent or Trade-Mark Law will also be freely answered by these attorneys.

No. 2,423,102, Rendering of Fatty Materials, patented July 1, 1947, by Harvard L. Keil, Clarendon Hills, Ill., assignor to Armour and Company, Chicago. A process for rendering fats from animal fatty materials wherein said fats are held by protein tissue comprising conditioning said fatty materials by mixing therewith a proteolytic enzyme material while said fat is still held by said tissue, said enzyme material being in an amount of from 0.005 per cent to 0.020 per cent by weight of said fatty material, and while said fat is still held by said tissue, heat treating said conditioned material to produce liberation of the fats from the protein tissue by subjecting the tissue at a pH in excess of 6.0 to the action of heat in excess of 140° F., and separating the released fat from the protein material.

No. 2,423,137, Cleaning and Preserving Composition, patented July 1, 1947, by Glenn P. Beach, Oakland, Calif. A cleaning and preserving composition adapted to be dispersed in water, the organic constituents of which comprise about 40-55 per cent by weight of wax, a major portion of which is a non-glyceryl ester wax having a minimum melting point of about 70-75°C. and a minor portion of which is an ester wax having a minimum melting point of about 60°C., a drying oil in amount about 20-50 per cent of the total weight of the wax, and about 18-22 per cent by weight of water soluble fixed alkali, which alkali substantially entirely has combined with fatty acids derived from wax and from the drying oil.

No. 2,423,261, Germicidal Product and Method of Producing Same, patented July 1, 1947, by Frank J. Sowa, Cranford, N. J. The method of incorporating diphenyl mercury as a bacteriostatic and fungistatic agent in a textile product which comprises the steps of applying to said textile product an aqueous solution containing the reaction product of a phenyl mercury salt and triethanolamine and thereafter decomposing the resulting reaction product by heating to a temperature not exceeding about 350°F. to produce diphenyl mercury in situ in the textile product.

No. 2,423,284, Insecticides, patented July 1, 1947, by Francisco E. Babbini, Lima, Peru. An insecticidal composition which contains in intimate admixture, capsicum as an irritant agent, sabadilla seed as a source of toxic veratrine and methyl crotonic acid, and a member selected from the group consisting of the sulfate, carbonate and hydrate of lime as an activator, said composition being effective against Dysdercus, aphis, roaches, lice, fleas and the like.

No. 2,423,435, Method of Making Soap Cake Having Desired Insignia, patented July 8, 1947, by Leslie A. Block, Rochester, N. Y. The method of making a soap cake having a distinctive insignia, which comprises forming from dry soap material a hard distinctive insert having the shape of the desired insignia, providing in said soap cake a recess smaller than the display surface of said insignia, and pressing said hard insert into the recess in said soap cake of softer soap material and displacing the soft soap of said cake by said hard soap insert.

No. 2,423,449, Preparation of Spray Dried Soap Particles Having Only Slight Dust-Forming Tendencies, patented July 8, 1947, by Robert Franklin Heald, Nutley, and Minor Leslie Givan, Orange, N. J., assignors to Colgate-Palmolive-Peet Company, Jersey City, N. J. A process of treating soap in the form of spray dried particles to reduce the dust-forming and lumping tendencies thereof which comprises spraying said spray dried particles after formation with about 0.5 per cent to 3 per cent of a heavy mineral oil fraction, said percentage being based upon the amount of mineral oil in the final product, whereby improved particles having only slight dust-forming and lumping tendencies are produced.

No. 2,423,450, Preparation of Synthetic Organic Detergent Particles Having Only Slight Dust-Forming Tendencies, patented July 8, 1947, by Robert Franklin Heald, Nutley, and Minor Leslie Givan, East Orange, N. J., assignors to Colgate-Palmolive-Peet Company, Jersey City, N. J. A process of preparing detergent particles, which comprises forming particles of a synthetic organic non-soap water-soluble detergent of the class consisting of sulphates and sulphonates, and spraying said particles after formation with about 0.5 per cent to about 3 per cent of a mineral oil fraction having an initial boiling point of about 350°F., said percentage being based upon the amount of mineral oil in the final product, whereby improved particles having only slight dust-forming tendencies are produced.

No. 2,423,451, Soap Product and Method of Making Same, patented July 8, 1947, by Stanley Joseph Holuba, North Bergen, N. J., assignor to Colgate-Palmolive-Peet Company, Jersey City, N. J. The process which comprises coating preformed soap particles with a water-soluble silicate salt in an amount effective in reducing dust.

No. 2,423,452, Process for Treating Sprayed Dried Organic Detergents, patented July 8, 1947, by Stanley Joseph Holuba, North Bergen, N. J., assignor to Colgate-Palmolive-Peet Company, Jersey City, N. J. A method of treating spray-dried organic detergent particles which comprises the step of exposing the particles to an atmosphere of saturated steam to heat the particles above about 70°F. but below about 220°F., subjecting said particles to impact while in a plastic condition resulting from said exposure to steam until the apparent specific gravity has been substantially increased and thereafter drying the particles.

No. 2,423,457, Preparation of Parasiticidal Mixtures, patented July 8, 1947, by George E. Lynn and Bernard J. Thiegs, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. The method for preparing parasiticidal dusts and powders which includes the steps of emulsifying a water-insoluble organic toxicant in water at a temperature above the melting point of the toxicant, wetting a finely-divided solid carrier with the emulsion to form a plaster-like slurry, drying the mixture, and grinding the dried residue.

No. 2,423,611, Copper Hydroxy Soaps, patented July 8, 1947, by Arthur Minich, Westfield, N. J., assignor to Nuodex Products Co., Inc., Elizabeth, N. J. As a new chemical, fungicidal, anti-fouling insecticidal compound: a dry granular hydroxy copper soap of a plurality of acids one of which is naphthenic acid and the remainder of which is selected from the soap-forming acid group consisting of oleic acid, 2-ethylhexoic acid, hydrogenated rosin, cocoanut fatty acid and stearic acid.

No. 2,423,576, Apparatus for Making Soap Cakes Having Desired Insignia, patented July 8, 1947, by Leslie A. Block, Rochester, N. Y. In an apparatus for providing insignia in a soap cake, the combination with a mold assembly provided with a cavity for a soap cake and having a well provided with an aperture having the shape and size of the desired insignia, of a plunger member movable through a body of distinctive soap material, cooperating with and entering the apertured wall simultaneously to form a soap insert of a definite depth and to move the same through said apertured wall and into said soap cake, and an actuating means operatively connected to said plunger member and for moving the same into and through said aperture for soap insert formation and movement.

No. 2,423,619, Method of Preparing Copper Fungicide Solutions, patented July 8, 1947, by Leo Roon, South Orange, N. J., assignor to Nuodex Products Co., Inc., Elizabeth, N. J. The herein described method of making water-insoluble copper soap which comprises: reacting water-insoluble copper raw material selected from a group consisting of copper metal, copper hydroxide, and copper carbonate, together with at least one substantially water-insoluble monobasic organic acid in the presence of aqueous ammonia, the copper raw material and the acid being present in stoichiometric quantities to produce an aqueous ammoniacal solution of a substantially water-insoluble copper soap.

No. 2,423,638, Process of Refining Oil and for Producing Soap, patented July 8, 1947, by Benjamin Clayton, Houston, Tex., assignor, by mesne assignments, to Benjamin Clayton, doing business as Refining Unincorporated, Houston, Tex. The process of producing an improved soap product from the soap stock resulting from refining animal and vegetable oils, which comprise subjecting a relatively dry mixture containing neutralized oil and soap stock to centrifugal separation in the presence of a hydrating agent containing tall oil soap to produce a mixture of soap stock and tall oil soap, promptly thereafter heating the mixture of soap stock and tall oil soap, discharging the heated mixture into a vapor separating chamber, removing vaporizable impurities from the heated mixture in said vapor separating chamber to produce a purified soap product, removing said product from said chamber and cooling said product.

No. 2,424,068, Process for Mothproofing Furs, patented July 15, 1947, by David Traill, Ardrossan, and Andrew McLean, West Kilbride, Scotland, assignors to Imperial Chemical Industries Limited. A method of mothproofing furs which comprises immersing the furs for a period of at least 16 hours in a bath comprising between 2 and 3 per cent of 40 per cent formaldehyde and between 3 and 4 per cent of 31 per cent hydrochloric acid in a saturated solution of common salt.

No. 2,424,220, Insecticide Containing an Amyl Imide of 3-6 Endomethylene-4-Cyclohexene -1,4- Dicar-Boxylic Acid, patented July 22, 1947, by Euclid W. Bousquet, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del. A fly spray composition containing pyrethrum and an amyl imide of 3,6-endomethylene - 4 - cyclohexene - 1,2-dicarboxylic acid dissolved in a fly spray base hydrocarbon solvent, the amount of said imide being at least equal to 10(100X-P) mgs. per 100 cc. where P=mgs. pyrethrum per 100 cc., and is at least 5, and X= the volume ratio of fly spray to concentrate = at least 1/1.

WEST DISINFECTING

(*From Page 37*)

drug, hardware, grocery and chain outlets. This method of sales presentation, being entirely separate from the rest of the company business, has

been handled under the active sales leadership of Benedict Stearns for over thirty years.

West has enlarged its export business greatly in the past decade, and now maintains agents in Mexico, Cuba, Peru, Venezuela and other Central and South American countries and the West Indies.

WEST has always associated itself with general industry activities. M. M. Marcuse was one of the organizers in 1914 of the National Association of Insecticide and Disinfectant Manufacturers, Inc., and was one of its first presidents. Dr. William Dreyfus was a moving light in the NAIDM during his many years of activity. John Marcuse has always been active in Association work and until several years ago was a member of its Board of Governors. Leonard Oppenheimer is currently a member of the Board and active on the Executive, Legislative, and Policy Committees. West also participates actively in the two soap industry trade associations and the Tissue Association.

As did most members of the industry, West Disinfecting gave its undivided effort in the country's industrial mobilization during World War II. John Marcuse and William Flatow, Jr., who has been a leader in development work for West for the past ten years, practically commuted to Washington during most of the war period. In addition to furnishing the government with portions of its requirements of regularly produced items, West cooperated with the War and Navy Departments in the development of several important specialty items. The armed services were experiencing unusual losses due to injuries from powder flash burns. The West laboratory was an important factor in developing a skin protective cream which, when applied before battle, prevented severe flash burns from exploding shells or bombs. This was one of the secret product developments of the war and was not disclosed to the public until shortly before the cessation of hostilities. Further in conjunction with its protective cream development, West furnished the armed services with a special protective cream which prevented severe sunburn due to prolonged exposure. This product was invaluable to fliers shot down at sea and undoubtedly saved many lives. The company's mechanical department devoted a great deal of its production time during this period to the manufacture of government specification calipers in measuring instruments used by the Navy, and was a sub-contractor on radar, gun and tank parts.

West Disinfecting's aim for the future is high. It has been a leader in its field for over a half-century and it intends to maintain this position. Under a young, aggressive management, it promises a continuation of new developments in the field of sanitation and industrial maintenance.

Builders for Cationics

In a 0.01 Normal sodium sulfate solution, a concentration of 0.0025 per cent of cetyl trimethyl ammonium bromide produced the maximum lowering of surface tension, while in the absence of sodium sulfate, a concentration of 0.015 per cent was necessary for the same effect. By addition of extremely small quantities of sodium sulfate the concentration of cetyl trimethyl ammonium bromide required to produce a given effect as an antiseptic was halved. J. A. Hill and C. L. F. Hunter. *Nature 158*, 585.

Micelle Structure

Measurements of the densities, viscosities, and diffusion of "Aerosol MA," which is di-(2-hexyl)succinate, indicate that the critical concentration for micelle formation in aqueous solution is about 1.1 per cent "Aerosol MA." A second critical concentration probably exists at about 5 per cent in aqueous solution. The diffusion coefficient and the partial specific volume are constant in a concentration range between the first and second critical points.

A modification of the spherical micelle picture of Hartley is proposed in which solvent penetrates the micelle to an extent dependent on the distance from the center of the micelle. In the concentration range between the first and second critical points, "Aerosol MA" micelles contain about 24 detergent molecules which, on a volume basis, constitute about 62 per cent of the micelle, the remainder being solvent. R. J. Vetter, *J. Phys. & Colloid Chem. 51*, 262-7 (1947).

Krafft Point of Soap

The Krafft point is the temperature at which a soap solution becomes opaque. It may be termed the point at which cogel or crystal formation takes place. This is a definite characteristic of soaps which varies only a little with the soap concentration, increases with an increasing number of carbon atoms in the chain, and with sodium soaps is a little lower than the solidification point of the corresponding fatty acids. The Krafft point of sodium stearate is 79, of potassium stearate 48, of sodium laurate 38, and of potassium palmitate 30.5. H. Demarcq. *Inds. corps gras 2*, 341-52, 370-5; through *Chem. Abs.*

Color Reactions

Certain color reactions can be used for the identification of different types of surface-active agents. Methylene blue and uranin in equal quantities give the following color in transmitted light: with an anion-active, yellowish green to dark green with strong fluorescence; with a nonionic agent, navy blue with little fluorescence; with a cation-active agent, vivid blue to bluish red, with no fluorescence.

In dilutions of 1:2000 to 1:5000, the color changes so that it can be utilized for better differentiation between the products of the group proper and the neighboring group, for example, between acyl amides and alkyl aryl sulfonates. The former change considerably toward blue, while the latter remain unchanged or change very little. This change between dilutions of the same product shows that there is a different behavior in the charge of the molecules, in reference to the surface tension and the molecular charges of the solution. E. F. Gobel. *Rev. quim. ind. 15*, No. 173, 16-23, 340-7; through *Chem. Abs.*

Herring Oil Yield

The yield of oil and dry matter was decreased when the raw product was heated immediately before pressing. On pressing after heating to 40-45° C. difficulties arose on separating the oil from presswater. The experiments showed that the herring must be heated to 70-75°C. before pressing in order to get the best yield of oil and dry matter. The authors conclude that low-temperature treating is to be avoided in the herring-oil industry. O. Notevarp and E. Tornes, *Fiskeridirektorates Skrifter 1*, 7-83; through *Chem. Abs.*

Thermal Data

Heat capacities of alpha and beta forms of trimyristin, tripalmitin, and tristearin were measured, and the heats of fusion of the alpha forms of trimyristin, tripalmitin, and tristearin were calculated. G. H. Charbonnet and W. S. Singleton, *J. Oil Chemists' Soc. 24*, 140-2 (1947).

Nonionics Form Micelles

Soaps and other ionic detergents in solution diffract x-rays so definitely as to demonstrate the presence of lamellar miscelles. These micelles expand to take in layers of hydrocarbons when the latter are solubilized in the detergent solutions. It has not been known whether such lamellar colloidal particles exist in solutions of nonionic detergents, but experimental investigation shows that these also exhibit similar long spacings on x-ray examination in aqueous solution. The spacings are of the order of 40 to 150 Angstrom units and their value depends on the concentrations. J. W. McBain and S. S. Marsden, Jr., *J. Chem. Physics 15*, 211-12 (1947).

Glycerol in Refining Oils

Animal and vegetable oils are refined by adding glycerol or other polyhydric alcohols to the alkali solution used to remove fatty acids. The glycerol aids in dispersion of the alkali throughout the mixture, decreasing the amount of excess alkali required. It also lessens the degree of hydration of the soap particles, thus facilitating their coalescence and increasing their density so that the foots settle out rapidly, and aids the separation of entrained oil from the foots when heated to the melting point of 165-195° F., reducing oil losses. The improvement can be applied to continuous refining methods. E. S. Liebscher. U. S. Patent No. 2,415,140.

Rancidity in Ghee

Changes in the analytical constants of ghee or Indian butter fat were studied during rancidity development. Parallel changes in the alterations in each characteristic suggest that they all proceed from a single general cause. Large increases in acid value were almost invariably accompanied by large increases in Reichert, Polenske, and saponification values, and most significant, by big falls in iodine value. The inverse relation between rise in acidity and loss in iodine value indicated oxidative rancidity as the dominant factor in the normal spoilage of butter fat in the tropics. K. T. Achaya, *Nature 159*, 274 (1947).

SANITARY PRODUCTS

A SECTION OF SOAP

HEARINGS on the proposed regulations covering enforcement of the new federal Insecticide, Fungicide and Rodenticide Act, held late last month in Washington, brought out much interesting discussion of the new law and the regulations. Numerous changes in the regulations were suggested by those half-hundred hardy souls who braved the torrid Washington weather and attended. Many of the suggested changes will probably be made; others will not. On the whole, however, the USDA officials displayed a cooperative attitude,—to aid rather than hinder industry. They indicated that the reputable manufacturer will be shown every consideration, and that they will not be too tough at least until the new regulations are working smoothly and the kinks are ironed out. They invited industry to discuss its problems with them in the light of the new law.

Frankly, we do not envy the Insecticide Division of USDA the task which lies before it over the coming eight or ten months in adjusting its affairs to the new law and regulations, in handling the thousands of details connected with product registration and in answering the questions of industry. In our opinion, Congress gave the Division about half as much money as it needs to do the job promptly and completely. But that cannot be changed now. The Division is due to be snowed under. Everything which manufacturers can do now to familiarize themselves with the law and the regulations, and the use of unusual care in the preparation of applications and labels will help to minimize errors and delays, and the problems of USDA. Manufacturers should do their part of the job now, not six months hence. If they expect to receive consideration from USDA officials, they must also be prepared to reciprocate in this respect, and also to appreciate the size and scope of the job with which these officials are faced.

TO those of our friends in the industry who do not like the new insecticide law, nor any other law which regulates their operations, let us pass on a word of advice based on long observation of the workings of the old insecticide act. Familiarize yourselves thoroughly with the new law and the new regulations. Ignorance of the law is not only the essence of stupidity, but can be harmful and expensive to any business. Do not resent the law. Years of experience have proved it necessary, even though many of us may disagree with some of its provisions. Go along with it willingly and honestly, and avoid attempting to cut corners. Experience, likewise, has over the years shown this to be the course of common sense.

If you do not have technical brains in your organization who can prepare the copy for new labels and directions for use where necessary, hire them. If you do not know who these experts are, ask us and we will tell you. To attempt to muddle through without technical knowledge and label experience might prove costly. Amateur label preparation can sometimes be positively pitiful.

Do not try to kid the enforcement officials. They know all the tricks too. Where in the past they have been tolerant of honest mistakes promptly corrected, they have not hesitated to crucify the obvious chiseler. Being human beings, they are likely to follow a similar pattern in the future. Unless you are certain that your rights are being trampled underfoot unjustly, avoid to the last ditch going to court under the law. The ratio of convictions under the old act has been very high.

By this well-meant advice, we do not intend to convey to manufacturers that they must always roll over and play dead. Neither do we want to go on record as favoring in general laws which unduly restrict industry and business. But in this case, we have the law and must live with it. And the exercise of good common sense can do much to prevent friction and undue hardships in its enforcement.

Outlook for DDT.....

and DDT Insecticides

THE recent announcement of a price reduction on DDT, and the recognition that current productive capacity is well in excess of demand, has focused attention on the present position and the future outlook for this important insecticide material. Our editorial staff has in recent weeks been questioning producers about production and current productive capacity, and probing the possible future expansion of the market for DDT and DDT insecticides. Here are some of the answers received, mere opinions or at best informed guesses in many cases, but presented for what they are worth.

Although the consumption of DDT and DDT insecticides is greater in agriculture and related fields than in the household field, nevertheless manufacturers of household insecticides are very definitely interested in the general outlook for these materials. Estimates vary as to the actual consumption of material in the household field but conservatively many industry spokesmen agree that five million pounds per year in terms of technical DDT is a good working figure.

Reports from trade sources indicate that the productive capacity for technical DDT is rapidly approaching the potential of approximately 100 million pounds per year. Estimates obtained by *Soap & Sanitary Chemicals* directly from many of the producing companies indicate that during the 10 month period from September, 1946 to June of 1947, 45 million pounds of technical DDT were produced. The same reports indicate that as of today the current capacity is rapidly approaching eight million pounds per month, with an additional one million to one and one-half million production available per month should the need require it. It is safe to assume that the 100 million pound figure mentioned above is and can be a stark reality.

Why this production? Can this quantity of DDT be absorbed by the domestic market? How much DDT will the export market take? What will happen to the price of DDT and DDT compositions? How will the production of DDT be affected by newer insecticides?

This brief summary of the current position of DDT—and the outlook for the future—attempts to explore the answers to these obvious questions but due to the very nature of the questions involved and the various intangibles, it is difficult, if not impossible, to forecast with any great accuracy what the outcome will be. We will simply recite the facts as reported to us and note the various predictions as to what may happen, our purpose being primarily to project serious thinking on the part of members of the industry and to encourage an analysis of the present market picture in time to prevent what might become a serious situation.

TODAY DDT has found a very definite and important place in the insecticide picture, and it is the opinion of most industry spokesmen that there is every reason to believe that DDT will continue in volume use in the foreseeable future, even if other materials are introduced which may further supplement or substitute for it. It is the general belief that, based on the current real demand, the probable consumption here in the United States is of the order of 25 to 35 million pounds of DDT per year. To this must be added any increase in demand that may arise because of development of new uses (to be discussed later) and whatever new demands may arise as a result of current rehabilitation plans now being discussed by the State Department for Europe and Asia.

This latter factor may tend to increase consumption substantially, since during the calendar year 1946 it is estimated that over seven million pounds DDT (in terms of technical) were bought by various Federal and foreign Government agencies for use in overseas relief and rehabilitation work. During the latter part of 1946 and thus far in 1947, the matter of exchange has seriously affected purchases of these materials directly by the foreign governments themselves or trade factors within the countries. It is quite conceivable that with the current relief program, however, demand for DDT may well equal or exceed any previous quantity shipped for these purposes. Exports may thus become an increasingly important factor in absorbing current excess DDT production.

With the supply of DDT, and productive capacity as well, currently in excess of demand, it is doubtful that any further reasonable decrease in price will bring about a greater demand. Where DDT insecticides are really effective, control is probably being secured more cheaply than it has ever before been achieved with other materials. Particularly in the agricultural field, reduced prices seem to have but little effect in stimulating greater

demand for materials. Of course, there are many fields where insect control has never been possible prior to DDT because of the economics, but many of these have already succumbed to control using DDT.

Another important factor in this connection is that with all insect control, and particularly in the agricultural field, the actual cost of the insecticide is but a small factor when compared to the expense of labor and time of application. Further possible reduction in the price of the insecticide would be but a minor factor in the total cost of the pest control job, and could logically be expected to have little effect in stimulating increased use.

With the advent of chlordane, chlorinated camphene, benzene hexachloride and similar chlorinated materials, the question has been raised as to the effect these materials may have on the demand for DDT. Without attempting to evaluate each of these materials individually, work thus far has indicated that in many cases these newer materials supplement, rather than substitute, for DDT. For example, in cotton, benzene hexachloride and DDT combinations are already apparently proving effective, which opens an entire new field for DDT which did not exist prior to 1947.

In general, it seems safe to predict that the newer insecticides, including the dimethoxy derivative of DDT, will probably never have any appreciable adverse affect on the volume of DDT to be used.

SOME concern has been expressed recently that the residual hazards connected with the use of DDT around cows and dairies and the resultant finding of DDT in milk and in beef might result in reduced use in these fields. However, conversations wtih many authorities in this field have indicated that while there is currently some concern being expressed on this point, no drastic action need be anticipated, at least until certain chronic toxicity tests now underway are fully completed and evaluated. In this connection, there is increasing realization that many of the supplementary materials now being studied will not give the long-lasting effectiveness against cattle and other insects that DDT does. It is possible that even if the use of DDT is somewhat curtailed, it probably will never be completely stopped in these fields.

The further question is always raised that when prices are again somewhat more normal, the old standbys, such as rotenone and pyrethrum will again take their former places in the insecticide picture, perhaps affecting seriously the consumption of DDT. Considering the above mentioned recent decline in the price of DDT, the price of rotenone and pyrethrum will have to drop considerably before they will again resume their normal place in pre-DDT days. Of course, these botanicals will always have their place in insect control, but DDT will undoubtedly prove an important supplement in many fields of use, and in turn these botanicals will still be a supplementary aid to DDT.

The exact place of DDT in household sprays does not seem to be definitely established but this will be discussed more fully under "consumer confusion" a bit later. DDT even in concentrations as low as ¼ of 1% has an activating effect on other toxicants and has been used to advantage in this way as a space spray.

Some concern has been expressed by many in the household insecticide industry about the apparent lack of pest insects during the 1946 and 1947 seasons. While the experts themselves do not agree on the cause on this declining insect population some have advanced the theory that the use of the residual type of insecticides such as DDT, chlordane and similar materials may be a part of the answer. Others, advance the opinion that the cycle of nature through the influence of weather and similar factors may be the answer. The adherents of this latter theory advance the argument that the tremendous falling off in the demand for insecticides by the housewives is due to the fact that there "just are no flies or misquitoes to be seen." This is certainly not the place to discuss this matter exhaustively. However, if there has been this decline in the insect population and if this condition may be repeated, it will certainly have an important effect on the use of DDT as well as all other insecticides.

ANOTHER point affecting the possible consumption of DDT, is the lack of the real appreciation by users of household spray materials of a "space" as opposed to a "residual" type of material. Many in the industry have expressed the necessity of continuing education and promotion in order to show the gains to be made in the increased use of residual type materials for better control. A majority of factors in the industry have separate products and try to promote each type of material for a specific use while other factors have tried to put out a combination type of spray to serve both uses. The opinion has been expressed by many that these practices and the resulting lack of consistency leads to consumer confusion which is a major contribution to decreased sales. In this connection, too, the lack of definite statements by the proper officials as to the safety or lack of safety of the use of DDT in these types of sprays also contributes to confusion. As far as the general consuming public is concerned, in 1945 they were bombarded with notices on the goodness of DDT, to be followed in 1946 by a somewhat modified enthusiasm, and, finally, in 1947 by a definitely subdued publicity and cautious attitude including all sorts of fears and cautions with the realization that "after all, DDT does have its place, but . . . . "!

Work underway at the present time indicates that some of the more important insects attacking corn and cotton, are succumbing to DDT. If real control can be obtained by these uses of DDT, the result will be a substantial increase in DDT consumption. In the field of forest and ornamental tree insects, DDT has but scratched the surface in 1946 and 1947. Most industry representatives are extremely optimistic for increased use of DDT in this field and point to the approximately 200 tons of technical DDT alone used in the "experimental" Tussock Moth control program in Idaho during this past summer.

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COLORED SHOE POLISHES

By MILTON A. LESSER

PUTTING a high polish on shoes is a good American custom. It is good for appearances and morale and it is good for the leather. It is also good business. In normal years the retail value of colored shoe polishes sold in the U. S. averages about eighteen million dollars, with another seven million dollars being spent on white shoe dressings. Only 7 per cent of the average annual output is sold in shoe service shops. The rest is sold in regular consumer outlets like shoe and department stores, as well as grocery, hardware and drug stores.(1)

Colored and neutral shoe polishes are provided as pastes, creams and liquids. These are packaged in flat cans or jars, in collapsible tubes, and dauber-closured bottles. Technically, these polishes are of two types; namely, wax-solvent mixtures and emulsions. Regardless of type or consistency, all colored shoe polishes have certain ingredients in common. These are various waxes which are responsible for the gloss and protective qualities imparted by shoe polishes. Many waxes are suitable for such utility.(2). In most cases, blends are used; hard, gloss-impart waxes being plasticized with softer waxes.

Though expensive, carnauba wax is probably the most important hard wax used in shoe polish formulation. A vegetable wax obtained from South America, carnauba imparts easy and quick shine-producing qualities because it forms a smooth, relatively hard film of high light-reflective power.

During recent years, ouricury wax, another vegetable wax from South America, has been finding growing use as a partial or total replacement for carnauba. Nearly as hard as carnauba, but of darker color, ouricury is much less expensive. Candelilla wax, a hard vegetable wax from Mexico, is also used as a supplement to or a replacement for carnauba wax.

Softer waxes, like beeswax, ceresin (refined ozokerite) and various paraffin waxes, are blended with these hard waxes to prevent the formation of brittle films and to improve the spreading and other properties. Thus a typical commercial paste polish is described(1) as containing a blend of carnauba, ouricury, beeswax and a paraffin wax mixed with coloring matter and a hydrocarbon solvent.

Many synthetic waxes are employed in shoe polish formulations.(2) Before the war European companies, especially I. G. Farbenindustrie, had developed and patented a number of products for such purposes.(3, 4, 5, 6) American workers have not been idle, however, and many synthetic waxes, particularly suitable for making shoe polishes, have been developed.(7, 8) One recent patent, (9) for example, describes the production of a series of synthetic wax polish compositions which have been named "telomers." A number of formulas in the patent literature serve to illustrate the use of these telomers in the production of standard type paste polishes for shoes and leather products.

Lanolin or wool grease has recently been receiving considerable attention as a component of shoe polishes Obviously lanolin is not used in polishes as a gloss,(10) but its presence is undoubtedly beneficial to the leather.(11). According to the Davidsohns,(2) a small proportion of lanolin may be added to water-containing shoe creams and polishing waxes to improve the emulsions.

Occasionally, a small proportion of an oil is included in a shoe polish, but this is not common. Of pertinent interest, however, is the use

of hydrogenated or hardened oils, particularly castor oil, in such compositions.(12) According to several patents,(8, 13, 14) hardened castor oil may be usefully employed as a partial replacement for natural waxes or for other purposes in the formulation of shoe polishes.

Solvents are essential components of wax-solvent type polishes, serving as thinning and diluting agents for the waxes. Solvents are also used frequently in emulsion type shoe polishes. Turpentine has long been favored because of its high solvent power for waxes. The statement sometimes made that shoe polishes containing turpentine are injurious to leather has not been borne out by experimental evidence.(15) In this connection it may be mentioned that turpentine and turpentine products suitable for use in shoe polishes may be improved by adding small proportions of phosphatides.(16).

Since turpentine is rather expensive, various materials are used to replace it in part or entirely in polish formulations. Kerosene, Stoddard's Solvent and other organic solvents are employed as diluents for turpentine. Various turpentine substitutes, such as white spirit, serve as partial or total replacements. Quite often a combination of several solvents will serve more effectively than a single solvent and give results more comparable to turpentine with regard to solvent properties, flash point and evaporation rate.

Water-containing shoe polishes require the use of emulsifiers. Although other emulsifiers are employed, soap remains a most useful agent for stabilizing these preparations. Prepared soaps are frequently used, but the soap may also be formed *in situ* on mixing the oily and aqueous phases. Amine soaps, particularly triethanolamine soaps, find frequent recommendation as emulsifiers for shoe polishes.

Black and various shades of brown are the most popular colors for shoe polishes. Carbon black and other pigments find occasional use in these products; but in the great majority of cases the colors are obtained with dyes. Depending on the depth of color desired and the kind of dye used, polishes may contain from one to three per cent of coloring material.(17) Oil-soluble dyes are used in the wax-solvent types of polishes and are very advantageous in emulsion type polishes containing solvents because they give better color values.(2)

Many synthetic waxes are now supplanting carnauba wax in shoe polish formulations imparting easy shine-producing qualities

Oil-soluble nigrosine base and nigrosine derivatives are used for making black shoe polishes. For wax-solvent polishes, authorities (2, 18) recommend the use of solubilized nigrosine base to get improved coloring values. These colorings are prepared by heating nigrosine base with stearic acid or oleic acid to improve solubility in the wax mixtures. The usual proportions are one part of nigrosine base to two parts of oleic or stearic acid. Sometimes half of the oleic acid is replaced with an equal quantity of montan wax. Brown colors are usually best obtained by the use of dye mixtures to yield the desired shade.

Very often shoe polishes are tinted only slightly, generally a light tan or cream color, or contain no dyestuff at all. These neutral polishes can be used on all leather shoes, but are especially valuable for reptile skin shoes and for odd colors like red, green, blue and other shades used in ladies shoes.

Some manufacturers do not consider odor to be an important factor in shoe polishes. Nonetheless it has been found that a suitably perfumed product does have added appeal. Aside from materials like pine oil, sassafras oil and the like, commercial perfuming material houses provide compounds especially designed for use in shoe polishes. Nitrobenzene (oil of mirbane) has long been associated with the odor of shoe polishes, but the material is toxic and should not be used. A similar odor may be obtained by using about one-half to one per cent of trichlorobenzene or orthodichlorobenzene.(17).

Paste type black polishes containing carnauba wax were marketed as early as 1885.(1) Today, wax-solvent pastes in flat cans are probably the most widely sold shoe polishes. Federal Specification P-P-567 (June 23, 1943), covering paste shoe polishes only, requires that such products shall consist of wax mixed with a volatile solvent to form a paste of suitable consistency. To be furnished in such colors as black, tan, brown or oxblood, the polishes must be free from toxic or dangerously inflammable materials; must have a pleasant odor, which should not become unpleasant on aging; and they must be capable of being readily applied and polished to a high gloss.

Formulas for making paste polish are available in technical sources. A typical formula and procedure, utilizing solubilized nigrosine and mixed solvents, as given by the Davidsohns, (2) is as follows:

	Parts
Carnauba wax	4
Solubilized nigrosine base (oleate)	2-3
Montan wax, crude	10
Paraffin wax (m.p. 50-52°C.)	14
Turpentine	50
Benzine, heavy	20

The carnauba wax, broken into small pieces, is melted at 90-92°C. in a jacketed vessel, with constant stirring. When completely melted, the nigrosine is mixed in; followed by the montan wax in small pieces and finally by the paraffin wax. When completely melted, the turpentine is gradually run in at an initial temperature of about 80-85°C. and the thinning is completed by the addition of the benzine. The most suitable filling temperature is between 52 and 48°C.

When a specially hard polishing paste is desired, these authorities suggest the following combination:

	Parts
Carnauba wax, grey	8
Beeswax	8
Crude montan wax	5
Paraffin flakes (m.p.) 50-52° C.)	15
Turpentine	68

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A Test Method for Commercial Aerosol Dispensers

By Lyle D. Goodhue, Frederik S. Schultz
Neva Innes and Roy Stansbury
Airosol Inc., Neodesha, Kansas

AS a means of maintaining and improving the quality of commercial liquefied gas aerosols, a test similar to the Peet-Grady method for the evaluation of fly sprays is needed. Testing aerosols is more complicated than testing sprays because it is difficult to control the small dosages of concentrated liquefied gas solutions. Less than 0.5 g of a good aerosol will kill 50 per cent of the houseflies in a Peet-Grady chamber. Furthermore, the dispensing device influences the effectiveness so the evaluation should be made on the aerosol solution in its original package. Also, the standard of comparison should be applied from a standard dispensing device in a manner closely resembling the practical use of a commercial aerosol dispenser.

The following is a rapid procedure for the determination of the comparative effectiveness of liquefied gas aerosols in commercial aerosol dispensers. It is similar to the method originated by Dr. W. C. O'Kane for testing the effectiveness of different aerosol formulations. The method consists of exposing insects to three different dosages; one to give a low kill, one to give a medium kill and one to give a high kill. The exact amount of each dosage cannot be controlled but is determined accurately after spraying by the loss in weight of the dispenser. After the results of the knockdown and kill are obtained, a curve is plotted on log-probability paper (probits paper). If the tests have been conducted properly and the insects are normal, a nearly straight line is obtained by this method of treatment. The proximity of the points to a straight line is a good check on the reliability of the determination.

Three dosages of the standard are also run to obtain a curve for comparison to the unknowns. The entire series is run three times and an average in each range of dosages is plotted against the average of the kill or knockdown, as the case may be. The arithmetic average of the dosages and mortalities appears to be satisfactory if the dosages in each range do not vary greatly. If desired, each determination can be plotted as a separate point and a straight line drawn in the best observed position.

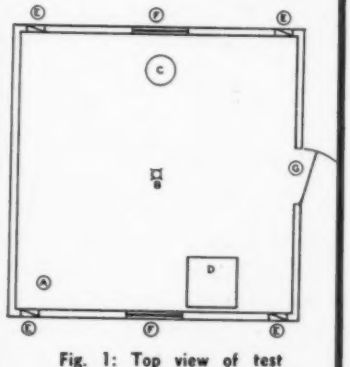


Fig. 1: Top view of test chamber showing arrangement of apparatus: A. 10-inch oscillating fan; B. Light; C. Test cage, support and cover; D. Exhaust fan; E. Air inlets; F. Windows; G. Door.

Materials

Test Insects

HOUSEFLIES 4 to 5 days old were used as the test insect. They were reared and handled similarly to the standard Peet-Grady procedures. The flies were vigorous and apparently normal in every respect.

Test Chamber and Accessories

The most practical size for a test chamber appears to be 10 feet square and 6½ feet high. This gives a chamber large enough to enable the operator to control the aerosol dosage yet small enough to be cleaned easily. Although this is three times the size of a Peet-Grady chamber, it may be used without too much difficulty for free-flying insects also. It was provided with windows on two sides, a door on one side and four vents around the bottom, one at each corner. It was equipped with an exhaust fan. (See Fig. 1.) The door was provided with a smaller opening 4½ feet above the floor where the aerosol dispenser was introduced in the hand of the operator and sprayed the desired length of time. A shelf on the outside near the door was used to support a balance with a capacity of 1,000 grams accurate to .01 gram. The chamber was painted white inside and was lighted in the center by a strong bulb enclosed in opaque glass.

An oscillating 10″ fan was used to move the air in the chamber during the test. It was set in one corner opposite the door and adjusted to inter-

mittently sweep a current of air across the cage of flies. This oscillating fan was found to be superior to a steady flow of air. It gave lower results which were more nearly comparable to those obtained with free-flying insects.

The cylindrical test cages approximately 3½" in diameter and 8" long were made from 16 mesh screen wire soldered to the large size fruit jar rings for ends. (See Fig. 2.) Two longitudinal wire supports and a wire ring ¾ inch from the open end were used to hold the cage rigid. The ends were also of screen wire. On the permanently closed end, most of the fruit jar ring was cut away to allow for better circulation of air. The entire fruit jar ring was used on the removable end.

During the test, these cages containing approximately 150 flies were hung on a support near one window in the test chamber (See floor plan Fig. 1). A long cylindrical cover made from two No. 10 tin cans was let down over the cage to protect the insects from receiving a large initial dose of the aerosol when it was first sprayed into the chamber (Fig. 2). This cover was removed after mixing 30 seconds by raising it with a cord extending over a pully to the outside of the chamber.

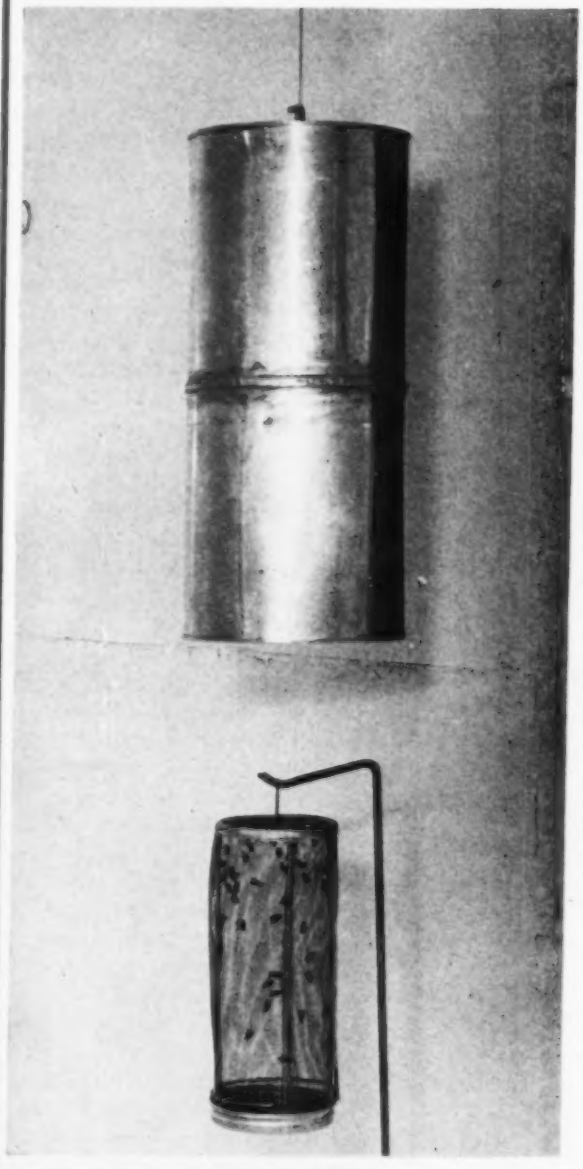


Fig. 2: Test cage of flies on support and removable cover. The cage is made of 16 mesh screen wire and the ends are sealed by soldering on large size fruit jar covers. During the test these cages contained approximately 150 flies and were hung on a support near one window in the test chamber.

The long cylindrical cover shown at the top, made from two No. 10 tin cans, was let down over the cage to protect the insects from receiving a large initial dose of the aerosol when it was first sprayed into the chamber.

Standard Aerosol Solution and Dispenser

The standard insecticide used for comparison with the unknowns was the Army formula containing

	Per cent
Pyrethrum Extract (20%)	2
DDT (Aerosol Grade)	3
Cyclohexanone	5
Mineral Oil (SAE 30)	5
Freon—12	85

This is a good effective formula that can be duplicated easily in any laboratory.

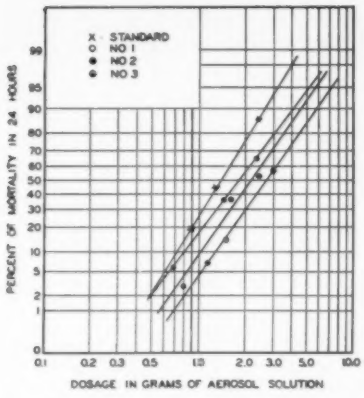
The most convenient type of standard spray nozzle is one having fingertip operation similar to some of those already in use on commercial dispensers. It is desirable to have a fixed rate of flow and a nozzle that can be duplicated. A push button valve with a small length of .015" I. D. capillary as a nozzle has proven very satisfactory.

Method of Testing

ENOUGH 4 and 5 day old flies for one day were mixed in a large cage to obtain a random lot for filling the test cages. This large cage was provided with a sleeve for the insertion of the hand to aid in mixing and driving the flies into the smaller cages.

The test cages were carefully cleaned in trichloroethylene and then with soap and water to remove residues from previous tests. No trouble with residues was encountered. The chamber was carefully cleaned by wiping the walls with a mixture of 40 per cent acetone, 50 per cent isopropyl alcohol and 10 per cent water. The floor of the chamber was covered with clean paper. The blades of the oscillating fan were cleaned with a solvent.

A test cage containing approximately 150 flies was hung on the stand near the window and covered by the large tin cans. The oscillating fan was then started. A carefully weighed aerosol bomb was sprayed for the required length of time by holding it at arm's length through the opening in the door and time was started. It was re-weighed to determine the exact dosage introduced. After 30 seconds the cover over the flies was lifted and the exposure was continued for five minutes more. The ventilating fan was



started and the cage of flies removed. The flies were then transferred to a holding cage and the knockdown at the end of ten and fifteen minutes was determined. They were provided with food and mortality counts were made after 20 to 24 hours.

The chamber was ventilated for a sufficient time to completely remove any aerosol in the chamber. All the low dosages in any one series were run before the chamber was cleaned and the paper on the floor changed. This cleaning procedure was repeated after running the samples of the medium and the high dosages. It is necessary to keep the chamber nearly as clean as when free-flying insects are used or floating particles of insecticide will cause erratic results.

Results

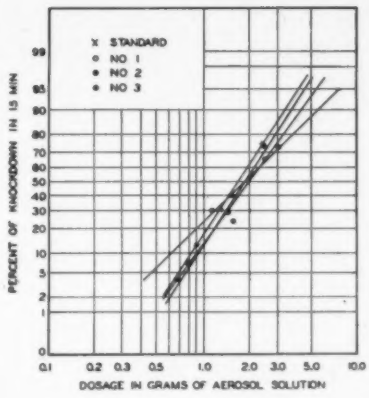
THE results of three series of tests on three brands of commercial aerosol dispensers in comparison to the Army formula as the standard are shown in Table I and graphically in the charts. As expected, a formula with a high pyrethrum and low DDT content gives a relatively higher knockdown and lower mortality as in sample No. 1. With a relatively lower pyrethrum and a higher DDT content the knockdown is lower and the mortality higher as in samples No. 2 and 3. Consistent results have been obtained by this method on many experimental aerosol formulations both low and high pressure. In comparison to free-flying insects the results are slightly lower. In general the highest dosage that will kill about 90 per cent in the cage tests will kill 100 per cent free-flying insects when exposed 10 minutes.

TABLE I

Comparative effectiveness against caged flies of three commercial aerosol dispensers with the standard at three different dosage levels. Each figure is the average of three determinations.

Sample	*Dosage g/650 Cu. Ft.*	*Knockdown 15 Minutes*	*Kill 24 Hours*
		%	%
— — *Low Concentrations* — —			
Standard (a)	.90	12	19
1 (b)	1.15	30	7
2 (c)	.68	4	6
3 (d)	.79	7	3
— — *Medium Concentrations* — —			
Standard	1.20	30	45
1	1.54	40	15
2	1.45	25	36
3	1.60	24	36
— — *High Concentrations* — —			
Standard	2.44	74	86
1	3.02	72	56
2	2.47	64	67
3	2.48	74	52

(a)—The Standard—0.4% pyrethrins and 3% DDT; Commercial — (b) — No. 1 — High pyrethrum, low DDT; (c)—No. 2—Medium pyrethrum, high DDT; and, (d)—No. 3—Low pyrethrum and high DDT.



Summary

A RAPID cage method of testing commercial liquefied gas aerosol formulations against houseflies is described. Since an exact dosage cannot be predetermined, an approximation is made and the exact amount used is found by the loss in weight of the dispenser. A low, a medium and a high dosage is run on each sample. Each series including the standard is run three times and the average mortality and knockdown is plotted against the average dosage in each range on log-probability paper.

Storehouse Pests Control

When the offending insects are in well exposed positions and when infestation is of a minor character, spraying is frequently employed. The standard spray used in England is a solution of pyrethrins in oil of a specification similar to that of medicinal liquid paraffin. This mixture is free from dangers of commercial taint or damage to foodstuffs. The comparatively heavy nature of the carrier oil minimizes fire risks.

The liquid is normally applied from guns with adjustable nozzles, similar to paint spray guns, and operated by compressed air. Although the insecticide is sometimes used as a mist to remove flying insects, it is more usually applied as a film to all exposed surfaces including floors, ceilings, bags, or grain in bulk. *Pharm. J. 157,* 298 (1947).

◆

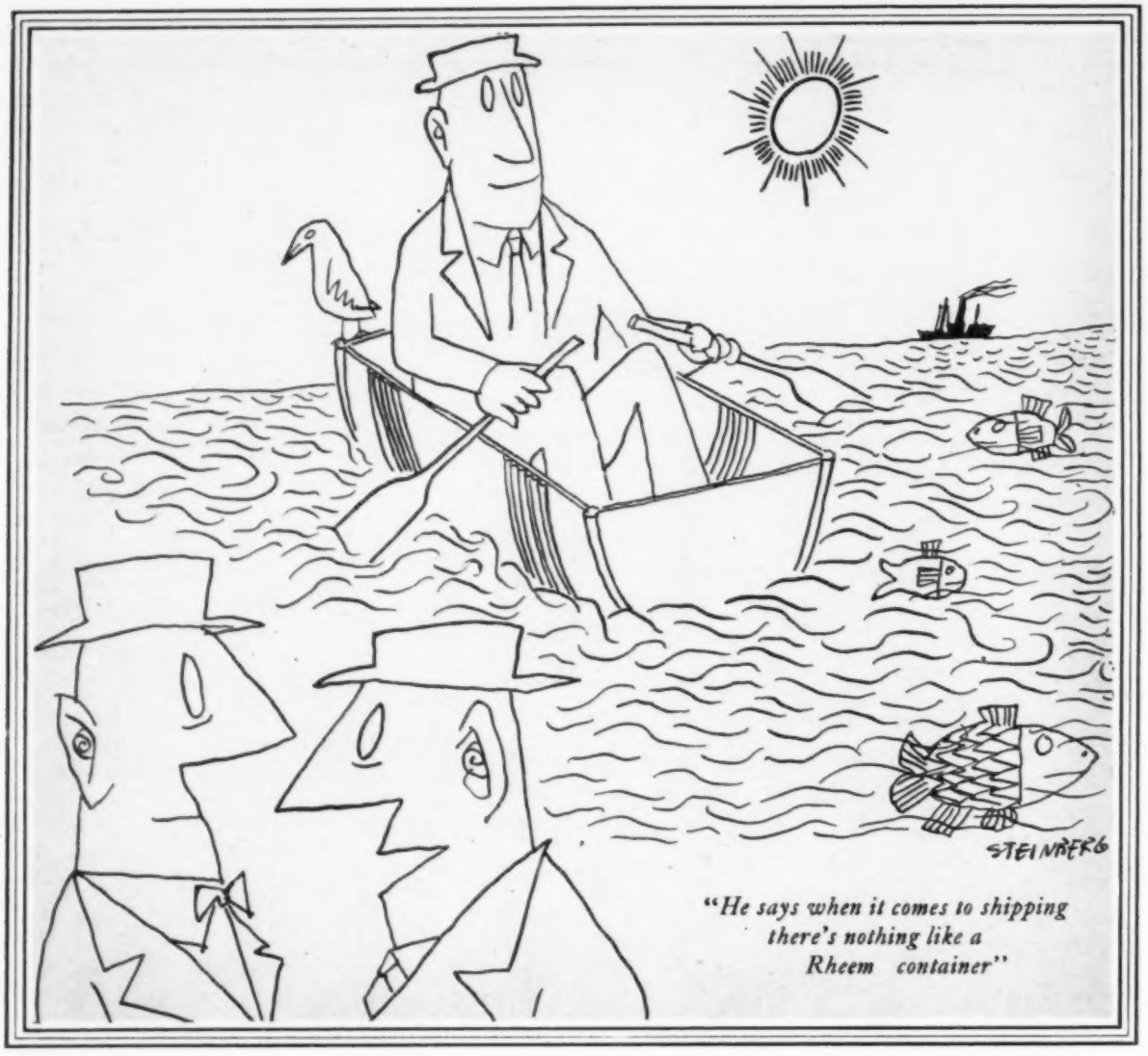
Mosquito Larvae Control

Dispersions of mist sprays of DDT-fuel oil solutions are a practical adaptation of this insecticide to the control of *Anopheles quadrimaculatus* larvae. Since the material is equally effective against all instars, an extension of the larvicidal interval from 2 to 3 days can be expected over that obtained with Paris green dusts. For routine treatments throughout the season, applications of no more than 0.05 pound of DDT per acre are recommended where fish life is important. These larvicides can be applied by means of light-weight air-pressure sprayers with savings in material and labor costs, by use of DDT-oil mist sprays. F. F. Ferguson, E. H. Arnold, and Wm. M. Upholt. U. S. Pub. Health *Repts. 62,* 296-302 (1947).

◆

Contact Insecticides

Tests with houseflies showed that bis(dialkylamino)butenes in concentrations from 4 to 7 per cent, give a somewhat higher average kill than did the official test insecticide containing 5 per cent of pyrethrum extract. G. H. Morey, to Commercial Solvents Corp. U. S. Patent No. 2,415,020.



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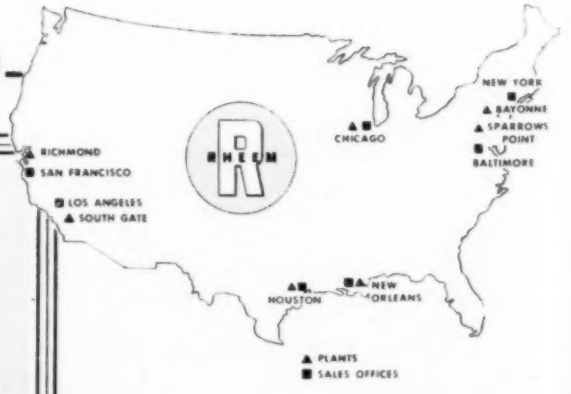

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Testing Quaternary Ammonium Sanitizers

as used in the Dairy Industry

W. S. Mueller, D. B. Seeley and E. P. Larkin*
Department of Dairy Industry, University of Massachusetts

THE limitations of the Food and Drug Administration method as a means for measuring the germicidal potency of quaternary ammonium compounds have been cited so often in the literature that it seems unnecessary to repeat them here. The germicidal potency of quaternaries is evaluated in the dairy research laboratory at the University of Massachusetts by a method which is not new, yet it involves the use of some new procedures and some refinements of older techniques. In brief, the method consists of the addition of a standardized inoculum to a germicide, and the results are simply reported as percentage survival or kill for defintie periods of contact time. The usefulness of this method depends largely upon the degree of accuracy to which the inoculum can be standardized, as to both number and vitality of organisms present, and also upon the efficiency of the inactivator.

Mainly, two quaternary ammonium compounds were used for this study, one an alkyl dimethyl benzyl ammonium chloride and the other a dialkyl diaralkyl ammonium chloride. Obviously, not all of the applications of a quaternary for dairy use can be covered in the space allotted to this paper; therefore only the highlights of our findings are given.

Description of Test Method

LIST of the various steps in procedure:

1. Wash vegetative cells or spores from agar slants into phosphate buffer solution. If spores are desired, heat to destroy vegetative cells.
2. Homogenize suspension.
3. Determine turbidity of suspension with spectrophotometer.
4. Standardize suspension to an established number of organisms per ml.
5. Place 99 ml. of the desired strength of the germicide in a two- or three-hole flask and place in constant temperature bath. Add organic material or other substances if desired.
6. Start motor-driven agitator.
7. Add one ml. of inoculum to germicidal solution.
8. Withdraw one ml. of solution after definite contact time and transfer to a solution containing the inactivator.
9. Make necessary dilutions, plate, incubate, and count according to Standard Methods (5).
10. Report results as percentage kill or percentage survival.

Homogenization of bacterial suspension: The usual procedure for breaking up the inoculum is by shaking. For this study, in order to secure a more homogeneous or uniform suspension, all inoculi were homogenized or emulsified with a small hand homogenizer manufactured by the Club Aluminum Products Co., Chicago, Ill. The hand homogenizer can be easily sterilized by heat, and according to the manufacturer its working pressure is approximately 600 lbs. per sq. in. Repeated trials with *E. coli*, and *B. cereus* showed no further breaking up of the inoculum after the fourth homogenization, but there was some indication that the *S. aureus* suspension was further disintegrated by additional homogenization. Microscopical examination also revealed that homogenization was more effective on suspensions of *E. coli* and *S. aureus* than on the sticky, long chain, spore-former *B. cereus*.

Standardization of number of organisms in the suspension: After homogenization, the number of organisms in the inoculum was determined with a model 11 Coleman spectrophotometer. Suspensions of *E. coli*, *S. aureus* and *B. cereus* showed the highest transmission at a wavelength of approximately 610 mμ. At the outset of this study, the inoculum consisted of a mixture of *E. coli*, *S. aureus* and *B. cereus*. Later it was found best to test each organism separately against the germicide. Transmission measurements and bacterial counts were made on various dilutions of the mixture of the three organisms and also of each one alone. From these studies standard concentration-transmission reference curves were plotted. Thereafter when an inoculum was prepared, only a transmission measurement was needed and the number of organisms present could be determined from the curve and the suspension standardized to a predetermined number by diluting. While the spectrophotometric method for standardizing the inoculum is not perfect, the results obtained are fairly accurate and may be made more so by further refinements in technique.

Stopping germicidal action by the use of an inactivator: The usefulness of the described method for determining germicidal potency depends laregly on whether or not the killing power can be stopped at once at the end of each contact period and not allowed to continue throughout the incubation period. While germicidal action can be checked by dilution, this means is impractical because it is often necessary to plate only slightly diluted

* Contribution No. 622 of the Massachusetts Agricultural Experiment Station. Presented at the Disinfectant Symposium, mid-year meeting of Natl. Assn. Insecticide & Disinfectant Mfrs., Chicago, June 9, 1947.

samples. Therefore the use of an inactivator is imperative.

For some time, sodium thiosulfate has been used extensively as an inactivator for chlorine. At the time this study was started, to the author's knowledge no inactivator for quaternaries which was entirely satisfactory had been recommended. Valko and DuBois (6) had shown that "Duponol PC" interfered strongly with the action of the quaternary. Baker et al (1) considered the antagonistic action of lecithin and phospholipids. The interfering action of soap has also been discussed (2).

Characteristics of a good inactivator are that in small amounts it must be positive and fast in action and not be germicidal itself. It must be effective for the entire time the plates are incubated (48 hrs.). It should be water soluble, stable to sterilization temperatures, and should not deteriorate upon standing for reasonable lengths of time.

In connection with this study, the following materials were investigated as inactivators for quaternaries and were all found to be inadequate in one way or another: bentonite, activated charcoal, turkey red oil, U.S.P. castile soap, tincture of green soap, "Duponol PC" and other anionic surface-active agents.

Lawrence (3) has recommended sodium naphthuride as an inactivator for quaternaries after studying the effect of this material in connection with the F.D.A. method of evaluating germicides. In our studies sodium naphthuride was evaluated as an inactivator to be used in the germicidal test which has been described, keeping in mind all of the characteristics which make a good inactivator. The test organisms used mostly were *E. coli*, *S. aureus* and *B. cereus* (24-hr. culture). It was found that 400 p.p.m. of sodium naphthuride was needed to inactivate 200 p.p.m. of the quaternary for a period of 48 hrs. The percentage of inactivation was noted to decrease for increasing periods of time. Sodium naphthuride (400 p.p.m.) showed no germicidal action by itself. It was also found that the maximum and minimum quantities of the inactivator that ordinarily would be carried over into the Petri dishes had no effect on the plate counts. The inactivator was found to be readily soluble in water, not affected by ordinary autoclaving, and in solution it remained effective when stored at approximately 40° F. for at least three weeks.

Indications are that sodium naphthuride is not effective for all organisms. While this inactivator is not perfect, to our knowledge it is the most satisfactory one which has been recommended.

Effect on Dairy Bacteria

E. *coli, S. aureus and B. cereus*: These organisms, representative of a Gram negative, a Gram positive and a sporeforming organism, were selected as the standard test organisms for many of the tests made in this study. All three organisms when obtained from 24-hour cultures were completely killed after a 5-minute contact with a 200 p.p.m. quaternary solution.

Thermoduric type bacteria: Three cultures were used for this experiment and they were isolated from milk cans which had been given ordinary can washing treatment. All three were Gram positive rods showing rapid spore formation. Two cultures survived a temperature of 208° F. (97.8° C.) for 30 minutes and the other one a temperature of 185° F. (85° C.) for 30 minutes. These organisms could easily survive pasteurization. The effect of varying times on 24-hour cultures of a mixture of the three sporeformers when in contact with 1000 p.p.m. of a quaternary is shown in Table 1.

TABLE 1

Effect of varying times on thermoduric sporeformers* in contact with 1000 p.p.m. of quaternary

Time of contact	*Average percentage survival of three cultures*
10 min.	64.5
15 min.	54.9
20 min.	55.6
25 min.	52.3
30 min.	49.2

It is evident that a 30-minute contact time with as much as 1000 p.p.m. of the quaternary will not satisfactorily reduce the percentage survival of these thermoduric sporeformers. Microscopical examination of 24-hour cultures of the three sporeformers revealed that approximately 48 per cent were spores, which is a close correlation with the percentage survival after 30-minute contact.

The effect of the quaternary on spores was also determined. The three thermoduric sporeformers were grown on standard agar for 15 days, cultures suspended in buffer solution and heated to kill any remaining vegetative cells. The inoculum used contained 5,267,000 spores per ml. After 30 minutes contact the percentage survival for the 1000 p.p.m. and 2000 p.p.m. was 82.0 and 72.3 per cent, respectively. The exposure of these spores to 2000 p.p.m. or 1:500 dilution for 30 minutes covers the most practical concentration and time that may be used for ordinary sanitizing procedures.

While the spore count was not reduced effectively by the quaternary, it is well to remember the bacteriostatic effect. In experiments where 200 p.p.m. of the quaternary was tested against the three thermoduric sporeformers (24-hour cultures) without an inactivator, the 1:100 dilution plate, containing a 1:50,000 dilution of quaternary was usually sterile. This observation implies good bacteriostasis for the quaternary against sporeformers.

Thermophilic type bacteria: Four cultures were used for this experiment and they were isolated from milk cans which were given ordinary can washing treatment. These organisms were Gram positive, non-sporing rods that grow well at 131°F. (55°C.) on standard agar. Germicidal tests on these organisms with 100 p.p.m. and 200 p.p.m. of a quaternary were made before a good inactivator was available. When depending upon high dilutions of 1:10,000,000 or higher for inactivation, the thermophiles showed no growth after 5 minutes contact time. In all probability they were killed because it does not appear that a quaternary could be bacteriostatic in the high dilutions employed.

* Inoculum—24-hour cultures, 33,000,000 organisms per ml.

Effect of Dairy Contaminants

EFFECT of cow manure and non-fat milk solids: For obvious reasons the germicidal properties of a quaternary should be evaluated in the presence of contaminants ordinarily encountered in actual use. A dairy sanitizing agent if used as an udder wash must often function in the presence of cow manure and other forms of soil. Also, if dairy equipment is not thoroughly cleaned, the sanitizing agent must function in the presence of milk solids. With these facts in mind the effect of varying concentrations of dry cow manure and dry non-fat milk solids on the germicidal properties of quaternaries were studied.

Varying amounts of dry cow manure were added to a quaternary solution so that the final solution contained 200 p.p.m. of active ingredient. One ml. of inoculum, containing 36,000,000 organisms (24-hr. cultures of *E. coli, S. aureus and B. cereus*) was added to the germicidal solution. After a 5-minute contact with the quaternary at room temperature, the percentage survival was determined and the results are given in Table 2. In the same manner the effect of varying concentrations of dry non-fat milk solids on the germicidal properties of a quaternary was determined and the results are also given in Table 2.

It appears that cow manure was more detrimental to the quaternary than non-fat milk solids. Approximately 0.3 per cent of either material produced the first significant decrease in germicidal potency. The fact that a relatively small amount of non-fat milk solids partly inactivated the quaternary indicates that it would not be practical to sterilize milk by adding a quaternary to the milk.

TABLE 2

Effect of cow manure and non-fat milk solids on the germicidal properties of a quaternary (200 p.p.m.)

Amount of dry cow manure and dry non-fat milk solids added	*Percentage survival after 5-minute contact time at room temperature*	
Per cent	*Manure**	*Non-fat milk solids***
0.000	0.0	0.0
0.045	0.0	0.0
0.090	0.0	0.0
0.180	0.2	0.0
0.270	0.3	1.2
0.360	18.3	8.3
0.540	90.0	35.8
0.720	100.0	45.8
0.900	100.0	63.9

* Inoculum—Mixture of *E. coli, S. aureu* and *B. cereus*. 1 ml. contained 36,000,000 organisms.
** Inoculum—Mixture of *E. coli, S. aureus* and *B. cereus*. 1 ml. contained 72,000,000 organisms.

Use as an Udder Wash

TWO quaternaries (200 p.p.m.) were used as udder washes on the college herd during the winter, each for a period of 4 weeks. No chapping or cracking of udders, teats, and milkers' hands were observed at any time for the duration of their use. In order to obtain information on the approximate length of time a quaternary solution will remain effective as an udder wash, tests were conducted on the college herd. A two-gallon portion of 200 p.p.m. quaternary was used for each test. After a varying number of cows was washed, a sample of the sanitizing solution was taken and the number of live organisms per ml. determined. Also, the germicidal potency of the solution was tested against a mixture of *E. coli, S. aureus and B. cereus* (24-hour cultures. The results obtained are given in Table 3.

TABLE 3

Germicidal potency of a quaternary udder wash

Number of cows washed	*Number of organisms per ml. of wash solution*	*Percentage survival of added organism**
10	7	0.0
20	16	0.0
30	45	—
40	2600	3.4
58	—	53.8

* Inoculum—1 ml. contained 391,000,000 organisms of *E. coli, S. aureus* and *B. cereus*.

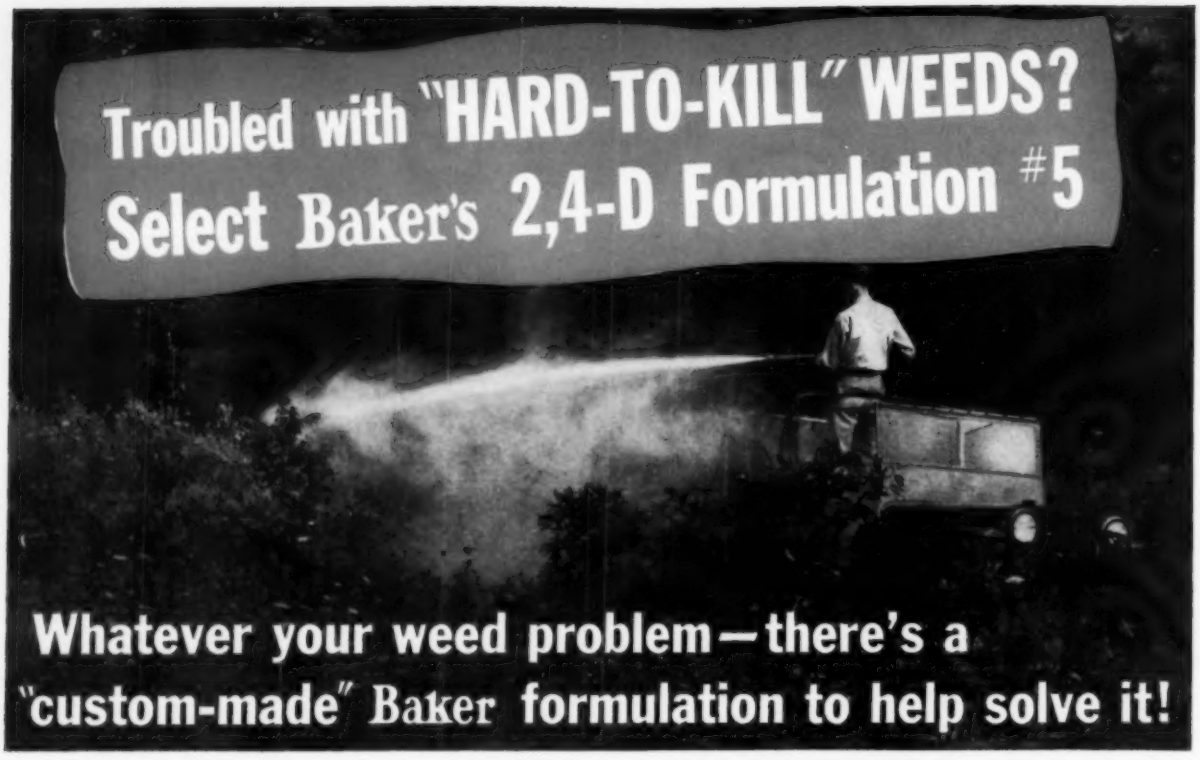
Under the conditions of this test, approximately 30 to 40 cows could be washed before the germicidal potency was decreased to a point where a fresh solution was needed.

The low percentage of survival is impressive in the light of the fact that the concentration of quaternary was only 100 p.p.m. and the amount of organic material was large. The amount of dishwash soil added to the germicide, no doubt, was more than is normally encountered in general practice. The analysis of a limited number of samples of dishwash water, obtained from various eating places, revealed none to exceed 0.7 per cent of total solid material. The relatively high germicidal potency of the quaternary in the presence of so much organic material is probably due in part to the pH of the product which is 10.5. It is well established that increasing the pH of the solution increases the killing power of a quaternary.

Sanitizing Milk Cans

PRESENT day can washers involve the use of detergents, hot water, hot air and steam. With all these tools in use, many plants are still unable to comply with the standard of 40,000 colonies per 40-qt. can as set down by Standard Methods (5). In cooperation with the Chemical Corporation, Springfield, Mass.; Winthrop Chemical Company, New York, and two large pasteurizing plants in Springfield, Mass., a study was made on sanitizing milk cans by additional treatment with a quaternary spray. In one plant the quaternary was injected under pressure with steam and in the other under pressure with air, both treatments following immediately after the regular cleaning and sanitizing treatments.

In order to obtain information on the amount of dirt to expect in udder washes, some of the solutions used for the test were analyzed for total solids, total organic material and total inorganic material. After washing the udders of 40 cows, in no instance did the wash water contain more than 0.30 per cent total solids, 0.17 per cent organic material and 0.13 per cent inorganic material. This concentration of dirt in the udder wash solution corresponds closely to the amount of manure and non-fat milk solids which gave the first significant inactivation of the quaternary.



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Cleaner-sanitizer Combination

RECENTLY a great deal of interest has been shown in dual purpose powders, designed to clean and sanitize in one operation. The limit to the length of this paper does not permit a discussion of the merits and limitations of such a procedure. However, attention is called to such products here because it is an excellent example of a situation where a quaternary is expected to function in the presence of a great amount of organic material.

Because of the possible application of its use to the dairy industry, tests have been conducted in the dairy research laboratory with a dual purpose powder, composed of alkaline cleaners, a sudsing agent and a quaternary ammonium chloride compound. This product was designed chiefly to be used for restaurant dishwashing operations. Its germicidal efficiency was tested against *E. coli* in the presence of a slightly modified standard dishwash soil (4) which contained the following ingredients: peanut butter, butter, lard, flour, dried egg yolk, and evaporated milk. Results obtained are given in Table 4.

The experiment was made during the summer months when the counts on the cans were probably at their highest. An average of twenty cans was examined daily during the test. As the cans went through the washer they were sprayed with a quaternary and in equal number of unsprayed cans served as the control. In some instances bacterial examination of the cans was made immediately after the can had left the washer and in other instances the examination was delayed for 24 hours, in order to note the bacterial condition at the normal time for the next filling. The procedure used for determining the sanitary condition of the cans was essentially that given in Standard Methods (5). Approximately 400 cans were investigated, and 200, 400 and 800 p.p.m. of quaternary were used. Since practically the same results were obtained with the three concentrations of the quaternary, the results are presented as averages in Table 5.

TABLE 5

Effect of spraying cans with a quaternary

	Samples taken immediately	*Samples taken after 24 hours*
Ave. number of colonies per untreated can	206,000	4,698,000
Ave. number of colonies per treated can	119,000	336,000
Percentage reduction as result of spray treatment	42.3	92.9

The marked increase in bacterial counts obtained for untreated cans after 24 hours was expected. The predominant types of organisms found on the plates were aerobis sporeformers, *chromogeni cocci*, and some thermophilic organisms. While the reduction in count is appreciable where the quaternary was used, the average count was not brought down to 40,000 per 40-qt. can as set forth by Standard Methods. The increased reduction as a result of the quaternary spray treatment for the 24-hour samples can probably be explained by the inhibiting action of small amounts of the quaternary.

In evaluating the results of this particular phase of the study, it should be kept in mind that they are of a preliminary nature only. Further tests are planned in which improved nozzles and other refinements in special apparatus for spraying the quaternary will be used. The use of better methods of applying the quaternary no doubt will increase the efficiency of the spray method of sanitizing milk cans.

TABLE 4

Germicidal potency of cleaner-sanitizer in the presence of organic material

Product	*Amount used*	*Concentration of quaternary*	*Amount of dish wash soil added*	*Percentage survival* after 5 min. at room temperature*
A	2 oz. to 4 gal.	100 p.p.m.	none	0.00
Same	2 oz. to 4 gal.	100 p.p.m.	4 per cent	0.86
B	2 oz. to 4 gal.	100 p.p.m.	none	0.00
Same	2 oz. to 4 gal.	100 p.p.m.	4 per cent	0.15

* Inoculum consisted of 1 ml. of *E. coli* suspension containing 150,000,000 organisms.

Sanitizing Milking Machines and Pails

TESTS showed that properly washed milk pails and the metal parts of milking machines can be effectively sanitized by immersing for three minutes in a solution of 200 p.p.m. of quaternary.

Proper sanitization of teat cups between each cow milked is a difficult problem. Tests were made at a dairy barn where it is the practice to scrub each teat cup after the herd has been milked and then soak the rubber inflation tubes in a lye solution between milking periods. During milking the teat cups are dipped in and out of a sanitizing solution immediately after each cow is milked. By use of a stopwatch it was found that the average time the teat cups remained in the solution was about one second. Two quaternaries were tested at this dairy barn using them in a concentration of 400 p.p.m. One second and ten-second contact times were used. These are the times that the teat cups actually remained in the solution. The average number of bacteria removed from the inner surface of the rubber inflation tubes on swabs was approximately 12,000. There was no significant reduction in count for the ten-second period over the one-second period. To increase the time of contact to one minute would mean an increase in the milking time of an hour for a herd of 60 cows. This would in turn cut into the efficiency of the barn routine. The solution to the problem of sanitizing teat cups between each cow milked is not apparent.

Summary and Conclusions

SINCE some of the results reported are only preliminary and since the study is being continued, the conclusions are only tentative.

1. A method is described for evaluating the germicidal properties of quaternary ammonium compounds. This method appears to give a truer picture of the germicidal properties under actual working conditions than

(*Turn to Page* 151)

Estimation of Pyrethrins

By Harvey A. Seil, Ph.D.*
Seil, Putt & Rusby, Inc.

BECAUSE of indicated variations in technique in different laboratories in use of the Seil Method for the Determination of Pyrethrins, Dr. Seil has agreed to republish his method exactly as it is conducted today by him. Cooperating in this republication has been the Chemical Analysis Committee, Insecticides, Dr. George W. Fiero, Stanco, Inc., chairman, Natl. Assn. of Insecticide & Disinfectant Mfrs.—The Editors.

Method I. Determination of Pyrethrins in Pyrethrum Flowers

(1) Place 12.5 g. of finely ground pyrethrum flowers (minimum 90% through 40 mesh) into an extraction thimble. Cover the sample with a cotton plug previously washed with petroleum ether.** Extract with petroleum ether in a Soxhlet extractor. After extraction is complete (usually 6-8 hours), evaporate the petroleum ether to a volume of approximately 40 ml., stopper the flask, and place it in a refrigerator at a temperature of 0 to 5 degrees C. for at least two hours (preferably overnight).

(2) Filter the cold extract through a small piece of cotton, previously wetted with cold petroleum ether, placed in the stem of a glass funnel and collect the filtrate in a 250 ml. erlenmeyer flask. Add 20 ml. of *chilled* petroleum ether to the extraction flask. With the aid of a rubber policeman, dislodge the resinous material in the flask, swirl the contents without allowing the wash liquid to warm up appreciably, and filter through the cotton. Repeat the operation twice using 10 ml. portions of chilled petroleum ether.

(3) Add several glass beads and remove the solvent on a water bath, without attempting to heat the residue long enough to remove the last traces of solvent.

(4) Add 15 ml. of 0.5 N ethyl alcoholic NaOH to the residue and reflux for one hour. Transfer the solution to a one liter beaker, wash the flask with two 25 ml. portions of distilled water. Add 1 ml. of deodorized kerosene.

(5) Dilute the sample with distilled water to a total volume of approximately 200 ml. Add a few glass beads and boil until the volume is reduced to approximately 150 ml. Add 1 g. of filter-cel and transfer the mixture quantitatively to a 250 ml. volumetric flask. Add 10 ml. of 10% barium chloride solution, dilute with distilled water to volume, and mix thoroughly. Filter through a fluted filter paper.

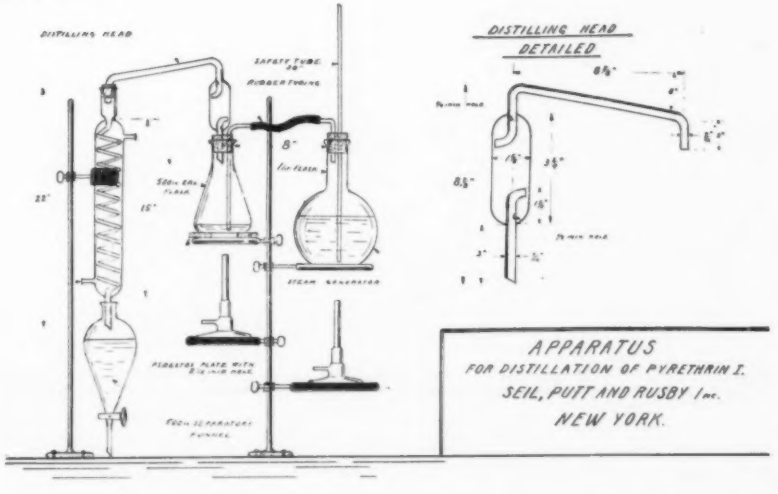
(6) Measure exactly 200 ml. of clear filtrate and transfer quantitatively to a 500 ml. erlenmeyer flask. Add one drop of phenolphthalein, neutralize with 1.0 N sulfuric acid and add 1 ml. of the sulfuric acid in excess. Distil with steam, using apparatus shown in Figure I, until the volume remaining in the flask is approximately 20 ml. The volume of distillate should be 250 to 350 ml.

(7) To the separatory funnel add 50 ml. of neutral petroleum ether then shake thoroughly for one minute.*** After the liquids have separated, draw off the aqueous layer into a second 500 ml. separatory funnel

Reagents

Petroleum Ether—light boiling (b.p. 20° to 40°C. at altitude where it is used.)
Phenolphthalein Test Solution
Sodium Hydroxide—0.02 N solution, standardized daily
Alcoholic Sodium Hydroxide—0.5 N Ethyl Alcoholic Solution
Ether—U.S.P. Grade
Sulfuric Acid—1.0 N Solution

Figure 1:



* With the cooperation of the Chemical Analysis Committee, Insecticide Section, NAIDM.
** Place a piece of glass rod under the thimble to assist in rapid extraction.
*** If an emulsion forms, add a few crystals of sodium chloride and shake.

to which a second 50 ml. of neutral petroleum ether has been added. Shake for one minute and after the liquids have separated discard the aqueous layer. Wash the petroleum ether in the first separatory funnel by shaking with 10 ml. of water using the same wash water for the petroleum ether in the second funnel.

Repeat with a second wash water of 10 ml. as before. Combine the petroleum ether extracts in the first separatory funnel. Neutralize 15 ml. of water containing 1 drop of phenolphthalein indicator solution with 0.02 N NaOH and add it to the combined petroleum ether solutions, then titrate with 0.02 N NaOH, shaking after each addition, until the aqueous layer is just pink. Each ml. of 0.02 N NaOH consumed is equal to 0.0066 g. of Pyrethrin I. The 200 ml. aliquot taken corresponds to 10 g. of sample. Therefore the number of ml. consumed times $0.0066 \times \frac{100}{10}$ gives the percentage of Pyrethrin I.

(8) Cool the flask containing the residue from the steam distillation and filter the solution through a Gooch crucible. Wash the flask with three 10 ml. portions of water and use these successively to wash the Gooch crucible. Transfer quantitatively to a pear shaped 500 ml. (Squibb) separatory funnel. Add 5 ml. of concentrated hydrochloric acid and saturate with sodium chloride to excess. Extract the mixture by shaking thoroughly for one minute with 50 ml. of ethyl ether. Draw off the aqueous layer into a second separatory funnel and extract again with 50 ml. of ethyl ether. Continue this extraction and drawing off of aqueous layer using 25 ml. of ethyl ether for the third and fourth extractions. Wash the ether extracts by shaking successively with exactly 10 ml. of distilled water, and repeat with a second successive wash using exactly 10 ml. of distilled water.

(9) Combine the ether solutions, draw off any water that separates and filter through a plug of cotton, previously wetted with ether, into a 250 ml. extraction or erlenmeyer flask. Wash the separatory funnel and cotton with 10 ml. of fresh ether.

Evaporate the ether on a water bath and dry the residue at 100° C. for 10 minutes. Blow gently into flask twice during the period to facilitate removal of vapors. Add 30 ml. of distilled water, boil to dissolve the residue and cool. Add a drop of phenolphthalein indicator and titrate with 0.02 N NaOH. Each ml. of 0.02 N NaOH consumed is equivalent to 0.00374 g. of pyrethrin II. The 200 ml. aliquot taken corresponds to 10 g. of sample. Therefore the number of ml. consumed times $0.00374 \times \frac{100}{10}$ gives the percentage of pyrethrin II.

Method II. Determination of Pyrethrins in Mineral Oil Sprays

(10) For flysprays not containing perfumes or other products which saponify to produce interfering organic acids, reflux 100 ml. of the spray with 15 ml. of 0.5 N ethyl alcoholic NaOH for two hours. Cool and transfer to a 500 ml. separatory funnel. Add 85 ml. of water, shake, and withdraw lower layer into a liter beaker. Shake the kerosene with four successive 25 ml. portions of water. Combine the washings and proceed as in paragraph (5) et. seq. The 200 ml. aliquot taken corresponds to 80 ml. of sample. Therefore the number of ml. of 0.02 N NaOH consumed in paragraph (7) times $0.0066 \times \frac{100}{80}$ gives the grams of pyrethrin I per 100 ml. of spray. Similarly the number of ml. of 0.02 N NaOH consumed in paragraph (9) times $0.00374 \times \frac{100}{80}$ gives the grams of pyrethrin II per 100 ml.

Method III. Determination of Pyrethrins in Extracts Containing Approximately 2% of Pyrethrins

(11) Pipette a 10 ml. sample of the extract, allowing the pipette to drain five minutes. Reflux with 15 ml. of 0.5 N ethyl alcoholic NaOH for two hours. Cool, transfer to a liter beaker, and continue as in paragraph (5) et seq. The 200 ml. aliquot taken corresponds to 8 ml. of sample. Therefore the number of ml. of 0.02 N NaOH consumed in paragraph (7) times $0.0066 \times \frac{100}{8}$ gives the grams of pyrethrin I per 100 ml. of extract. Similarly the number of ml. of 0.02 N NaOH consumed in paragraph (9) times $0.00374 \times \frac{100}{8}$ gives the grams of pyrethrin II per 100 ml. of extract.

Method IV. Determination of Pyrethrins in Pyrethrum Concentrates

(12) Reflux a sample containing approximately 200 mg. of pyrethrins (1 g. of a 20% concentrate) with 15 ml. of 0.5 N alcoholic NaOH for two hours. Cool, transfer to a liter beaker and proceed as in paragraph (5) et seq. The 200 ml. aliquot taken corresponds to 4/5 of the sample. Therefore the number of ml. of 0.02 N NaOH consumed in paragraph (7) times $0.0066 \times \frac{100}{\text{sample} \times 4/5}$ gives the percentage of Pyrethrin I. Similarly the number of ml. of 0.02 N NaOH in paragraph (9) times $0.00374 \times \frac{100}{\text{sample} \times 4/5}$ gives the percentage of pyrethrin II in the sample.

Note: Test a sample of all extracts and concentrates for freedom from oxidized pyrethrins (which are insecticidally inert) by diluting to approximately 200 mg. of pyrethrins per 100 ml. with petroleum ether. If the solution is not clear, treat the analytical sample in the same manner adding 1 g. of filter cel to the solution. Place flask in refrigerator for at least two hours, filter and wash quantitatively through a Gooch crucible. Evaporate the solvent, proceed as in paragraph (11) or (12).

Both pyrethrin I and pyrethrin II consist of a mixture of four compounds. The ratio of constituents in these mixtures may vary and with it their insecticidal properties. Pure pyrethrins and cinerins have been prepared for further study. F. B. LaForge and W. F. Barthel, *J. Org. Chem. 12*, 199-202 (1947).

NAIDM-USDA Report on QUATERNARY AMMONIUM TESTING

By L. S. Stuart*

THE following manuscript compiled by Dr. L. S. Stuart presents in condensed form data gained in over two years study of testing methods suitable for use in evaluating Quaternary Ammonium Compounds. The Insecticide Division, United States Department of Agriculture and a number of laboratory members of the National Association of Insecticide and Disinfectant Manufacturers worked closely in this cooperative study.

A great deal of commendation is due the officials of the Insecticide Division and representatives of the commercial laboratories for the time, effort and interest they have shown in this accomplishment. From the Cooperative Research Program a wealth of information has been gained regarding the germicidal activity of Quaternary Ammonium Compounds, information which will most certainly prove beneficial in future studies of these germicides.

The Executive Board of the Disinfectant Scientific Committee of the National Association of Insecticide and Disinfectant Manufacturers held a number of meetings over the past two years with the Department heads of the Insecticide Division and the two groups worked as closely as possible to produce a satisfactory method of evaluating the germicidal properties of Quaternary Ammonium Compounds. This method, or rather these two methods of test, are outlined in Dr. Stuart's report and we feel sure this compilation of information gained from the large number of testing laboratories will prove of utmost interest and benefit to the members of this industry as well as those interested in the subject from an academic viewpoint.

Our Committee publicly extends its thanks to the Insecticide Division of the United States Department of Agriculture and our own members for their contribution of knowledge towards this end.

JACK C. VARLEY
Chairman Disinfectant
Scientific Committee

FOLLOWING the December 1, 1946, meeting with the Disinfectant Scientific Committee in New York City, modifications were made in the October 1946 assignments 1, 2, 3, 4, and 5, and the 15 cooperating laboratories holding these assignments were notified regarding the modifications on February 7, 1947. The revisions in the 5 initial assignments were different for each laboratory and were outlined with the hope of obtaining one complete set of results for the entire initial program outlined. These 5 experiments were originally planned to provide a volume of data bearing on objections voiced against the FDA phenol coefficient method of testing quaternary ammonium compounds and suggestions for procedures that appeared to hold promise as being more suitable for these compounds than the FDA phenol coefficient method.

Such information seemed necessary inasmuch as no substantial volume of directly comparable data could be found which showed that any of the various procedures suggested for the replacement of the FDA phenol coefficient method would or would not give more uniform or more reliable results.

Only one laboratory completed the initial cooperative assignment. This assignment covered Experiment 3 and a brief analysis of the findings will be presented as an illustration of the type of information desired.

Although this study contained numerous variables it provided 2 directly comparable lots of 40 tests each varying only as to the method of exposing the test culture. The results should provide, therefore, a fairly reliable index to the levels of activity that would be obtained by a glass ring carrier method and a loop needle subsampling method. The average results in terms of the critical 10-minute killing dilution and calculated phenol coefficient values are given in Table 1.

The data also provide 40 tests made under a variety of conditions with buffer in which ionization should have been controlled for direct quantitative comparisons with 40 tests made under the same variety of conditions with distilled water dilutions where ionization was obviously an uncontrolled factor.

It is of interest to note that skips appeared in the tests where buffer was used 20 times out of 40 and in those tests without buffer 25 out of 40 times. The level of activity in the specific instances was higher when the buffer was used in 21 instances, lower in 15 instances, and exactly the same in the remaining 4 instances. The effect of buffering at the specific level selected, pH 6.4, seems therefore to be one of raising or lowering the level of activity depending upon both the specific quaternary ammonium compound and the composition of the test culture medium. It should be noted here also that in some instances the use of buffer doubled the apparent activity, whereas in other instances apparent activity was reduced by as much as 50 percent. These results emphasize the importance of the ionization factor in the germicidal activity of all quaternary ammonium compounds. It would appear from the results submitted that ionization is more of a factor in determining the level of activity than in reducing the number of skips.

This study provides 4 groups, of 20 tests each, in which the major variable is composition of the test culture medium. These groups show that the

*This progress report by Dr. Stuart, senior bacteriologist, insecticide division, livestock branch, production and marketing administration, United States Department of Agriculture, was made to the Disinfectant Scientific Committee, Nat. Assoc. Insecticide & Disinfectant Mfgrs., June 8, 1947, Chicago.

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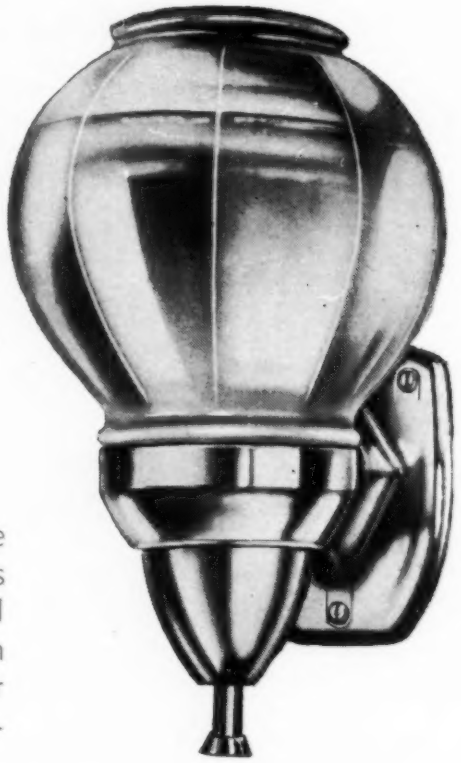

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average phenol coefficient, by a variety of methods, using the standard FDA broth cultures, was 130.34, and by using cultures grown in the same broth except for the substitution of B.B.L. Trypticase for Armour's Peptone the average phenol coefficient was 136.01, the coefficient being calculated on the basis of the actual quaternary ammonium salt content. While tests with some of the quaternary ammonium salts showed cultures propagated in FDA broth made with Armour's peptone to give higher results than when the test culture was grown in the same broth made with B.B.L. Trypticase, the reverse was true with other quaternary ammonium compounds tested. The introduction of such variables as buffer salts and carrier sampling reversed the apparent effect of the test culture peptone with some of the quaternary ammonium preparations tested. It appears therefore unsafe to draw any general conclusion on the effect of various brands of bacteriological peptones in the test culture medium on the activity of quaternary ammonium germicides as a group.

Cultures grown in FDA broth enriched with 10 percent horse serum were on the whole decidedly more resistant under all conditions than cultures grown in straight FDA broth. The average coefficient for the 20 tests made on cultures grown in serum-enriched broth was only 111.43, as compared with 130.34 for the 20 directly comparable tests made on FDA broth cultures. There were, however, 4 exceptions where the carrier method was used in which the test culture was found to be more resistant to some quaternary ammonium compounds when grown on FDA broth than when grown on serum-enriched broth. Thus, it would appear that uniform decreases in activity where the culture is added directly to the medicant solution may be the result of quantitative reactions, between the added serum and the quaternary ammonium compounds, reducing available concentrations of germicide, rather than to an actual change in cell resistance. It seems pertinent to speculate here on the ratio of disinfectant to organic matter in the FDA phenol coefficient procedure when the disinfectant is at the high dilutions at which activity is frequently reported for quaternary ammonium compounds. In this method 0.5 mls. of a broth containing 1.5 percent proteinaceous material is added to 5 mls. of medicant. This represents 0.0075 gms. When the dilution of the disinfectant used is 1 to 18,000 the actual amount of disinfectant present in the test is only 0.0003 gms. Under such conditions the organic material added is actually 25 times the weight of the active ingredient present. In the case of a material active at a dilution of 1 to 100, the ratio is 0.0075 gms. of proteinaceous material to 0.05 gms. of active ingredient or 6 times as much disinfectant as organic material. With a disinfectant active at a dilution of 1 to 667 the actual amount of active ingredient present in the test is equivalent in weight to the proteinaceous material added. Thus, it can be seen that with any disinfectant possessing coefficient values greater than 7.5, by the official FDA method, the organic material added cannot be considered as insignificant and actually should be considered as a major variant in the determination of comparative critical killing concentrations and death times.

On January 27, 1947, a meeting was held with the Executive Board of the Disinfectant Scientific Committee in Washington, D. C., to decide on the details for Experiment No. 6. Detailed outlines on this assignment, as agreed upon in that meeting, were forwarded to 18 cooperating laboratories. Five laboratories immediately notified the committee that they could not participate in this particular study owing to situations prevailing in their respective companies during the first 3 months of 1947. The assignment was completed and the results reported by 11 of the remaining 13 cooperating laboratories.

AN ATTEMPT has been made to analyze the results reported by these 11 laboratories. Table 2 shows the most probable critical 10-minute killing dilution suggested by the method outlined for *S. aureus* 209. This table shows critical killing dilutions ranging from less than 1-2,000 to 1-15,000 for Quaternary B; 1-1,000 to 1-9,000 for Quaternary C; and 1-1,000 to 1-8,000 for Quaternary E. The phenol control tests on the test cultures employed showed, in general, less resistance than prescribed for this ogranism in the official FDA method but ranged from 1-65 to 1-85. However, no correlation was observed between the levels of activity reported for phenol and the various quaternary ammonium compounds by the individual laboratories. Thus, the wide variations shown in Table 2 cannot be directly attributed to differences in the resistance of the test cultures employed.

Table 3 shows the most probable critical 10-minute killing dilution suggested by the method outlined when *E. typhosa* was the test organism. This table shows critical killing dilutions ranging from 1-2,000 to 1-21,000 for Quaternary B; less than 1-1,000 to 1-14,000 for Quaternary C; and less than 1-1,000 to 1-20,000 for sample E. Phenol control tests indicated that the resistance of the test organisms was, on the average, greater than that prescribed for *E. typhosa* in the FDA phenol coefficient procedure, although there was a much wider range in resistance with the strains of this organism used than with *S. aureus*

Table 1.

Levels of activity shown by representative quaternary ammonium germicides in carrier tests and in tests where the test culture was exposed according to the FDA phenol coefficient procedure[1]

Carrier sampling procedure as "Use Dilution Method"	*4 mm loop sampling procedure according to FDA phenol coefficient method*		*Safe use dilution as indicated by 20 x average phenol coefficient value found*
Critical 10-min. killing dilution Avg. 40 tests	*Critical 10-min. killing dil. Avg. 40 tests*	*Phenol coefficient Avg. 40 tests*	
1-8,500	1-14,575	161.75	1-3,235

[1] Results expressed on actual quaternary ammonium germicide content. The results in Table 1 indicate strongly that the simple expedient of changing from the FDA phenol coefficient test culture procedure to a glass ring carrier procedure cannot be relied upon to give use dilution results that can be interpreted directly in terms of recommended use dilutions possessing identical margins of safety. The carrier technique gave, on the average, use dilutions 2.3 times as high as the safe use dilutions calculated by the usual procedure from the average phenol coefficients found. While these results were presented by one laboratory and in no way invalidate claims made for other specific use dilution procedures, recommended by other workers, they do promote caution since it can be seen that such a method may well give results that would allow for usage at concentrations far more dilute than those now allowed under the FDA phenol coefficient procedure.

Table 2.

Most Probable Critical 10-Min. Killing Dilution Indicated By Method Outlined In Experiment 6 For S. Aureus 209 (11 Laboratories Reporting)

Laboratory	*COMPOUND* B	C	E
1	1- 4,000	1-5,000	1-4,000
2	1- 4,000	1-8,000	1-3,250
3	<1- 2,000	1-3,000	1-6,000
4	1- 4,000	1-3,000	1-1,000
5	1- 4,000	1-4,000	1-6,000
6	1-15,000	1-9,000	1-7,000
7	1- 5,000	1-9,000	1-4,000
8	1- 7,000	1-1,000	1-6,000
9	1- 4,000	1-4,000	1-5,000
10	>1- 8,000	>1-8,000	>1-8,000
11	<1- 7,500	<1-7,500	<1-7,500

Table 3.

Most Probable 10-Min. Critical Killing Dilution Indicated By Method Outlined In Experiment 6 For E. Typhosa (11 Laboratories Reporting)

Laboratory	COMPOUND B	C	E
1	(Reported results with *S. aureus* 209 only)		
2	1- 7,500	1- 5,000	1- 7,500
3	1- 2,000	1- 2,000	1- 2,000
4	1-20,000	1-14,000	1-20,000
5	1- 4,000	1- 4,000	1- 2,000
6	1-21,000	1-13,000	1-15,000
7	1- 6,000	1- 2,000	<1- 1,000
8	1- 4,000	<1- 1,000	1- 1,000
9	1- 3,000	1- 2,000	1- 2,000
10	>1- 8,000	>1- 8,000	>1- 8,000
11	<1- 7,500	<1- 7,500	<1- 7,500

Table 4.

Levels Of Activity Reported By The Carrier Method As Outlined In Experiment 6, and An FDA Phenol Coefficient Method Modified As To Composition Of Subculture Broth Only

Test organism	Cooperative sample	Critical 10-min. killing dilution[1]	
		Carrier Method of Expt. 6	Modified FDA phenol coefficient method
S. aureus	B	<1- 7,500	>1-15,000
"	"	1-15,000	1-24,000
"	"	1-14,000	1-21,000
"	"	<1- 2,000	1-14,000
"	C	<1- 7,500	1-12,500
"	"	1- 9,000	1-18,000
"	"	1- 9,000	>1-15,000
"	"	1- 3,000	1- 9,000
"	E	<1- 7,500	1-15,000
"	"	1- 6,000	1-20,000
"	"	1- 7,000	1-15,000
"	"	1-15,000	1-15,000
E. typhosa	B	1-15,000	1-21,000
"	"	1-21,000	1-23,000
"	"	<1- 7,500	>1-15,000
"	"	1- 2,000	>1-10,000
"	C	1- 2,000	>1-10,000
"	"	<1- 7,500	1- 8,750
"	"	1- 9,000	1-12,000
"	"	1-13,000	1- 9,000
"	E	1-11,000	1-15,000
"	"	1-15,000	1-17,000
"	"	1- 2,000	>1-10,000
"	"	<1- 7,500	1-10,000

[1] All dilutions reported on actual quaternary ammonium salt content.

209. The critical 10-minute killing dilutions for phenol reported were: 1-75; 1-80; 1-85; 1-90; 1-95; 1-100; and 1-110. No correlation could be found, however, between the relative levels of resistance to phenol and the test quaternaries by the individual laboratories.

The over-all range of activities appear to be considerably greater where *Eberthella typhosa* was the test organism than where *S. aureus* 209 was employed. It can be seen also, that with *S. aureus* 209 as the test organism 6 out of the 11 laboratories reporting found activities with the 3 unknown quaternaries falling within the general range of 1-3,000 to 1-6,000, whereas no such tendency for agreement could be observed when *E. typhosa* was the test organism.

It is believed that the failure to arrive at even approximate agreements on activity levels when *E. typhosa* was the test organism supports rather strongly the contentions of various individual workers in this field that this organism is not suitable for conducting use dilution or carrier tests.

Some laboratories reported results by the FDA method modified in that the "Letheen" broth prescribed in Experiment 6 was substituted for FDA broth in subculturing. The comparative levels of activity with the individual quaternary ammonium compounds found by the different methods are of special interest. They are listed in Table 4.

It is apparent from the data given in Table 4 that the margin of difference in the levels of activity found with the carrier method of sampling assigned and the FDA method of loop needle subsampling varies considerably between different laboratories. In some instances the results by the carrier method are low enough for direct interpretation as safe use dilutions in terms of results by FDA procedures. On the other hand, the average critical 10-minute killing dilution of *E. typhosa*, in 12 reports on the use dilution method, was 1-9,375, whereas the average for the tests conducted by FDA procedures in the same reports was 1-13,400. If we arbitrarily set the resistance of the culture to phenol at 1-90 it can be seen that the average safe use dilution calculated by ordinary FDA procedures would be about 1-2,980. (13,400 x 20/90 equals 2,980.) This is, therefore, less than 1/3 of that indicated by the use dilution method. Thus, it would seem proper to point out again that while carrier methods give uniformly lower results than FDA procedures with quaternary ammonium germicides the results may not be, on the whole, low enough for acceptance as safe use dilutions possessing the same margin of safety as those indicated by the FDA phenol coefficient procedure.

Inasmuch as the results with *E. typhosa* in the method outlined in Experiment 6 were highly erratic and since this tends to confirm previous reports of individual workers as to the unsuitability of this organism for carrier tests, analysis of the data submitted relative to so-called skips and wild plusses is confined to the data submitted in Experiment 6 on *S. aureus*. All work sheets submitted showed skips. The total number of dilution series reported by the individual laboratories, the number showing skips, and the ratio of time skips to dilution skips are shown in Table 5.

In compiling the data in Table 5 a "time skip" was defined as any dilution tube showing growth at any time interval subsequent to an interval indicating killing and a "dilution skip" was defined as any dilution that indicated killing at a given time interval when lower concentrations at the same time interval in the series indicated growth. The data shown in Table 5 are not strongly indicative but there is the suggestion that dilution skips are more frequently encountered than time skips since 42 dilution skips were found in comparison with 29 time skips, 4 laboratories reported no time skips at all whereas 9 of the 10 reporting laboratories reported dilution skips. This points to the importance of preparing the test dilutions so as to obtain uniformity in such factors as ionization, and adsorption of the quaternary ammonium compounds on the glassware used in avoiding skips.

SEVEN of the 11 laboratories participating in Experiment 6 reported difficulties in preparing the "Letheen" subculture broth prescribed. It was unfortunate that in the initial assignment it was stated that "No adverse effects have been noted, however, when all ingredients are boiled up together in the initial mixture" since subsequent tests in the

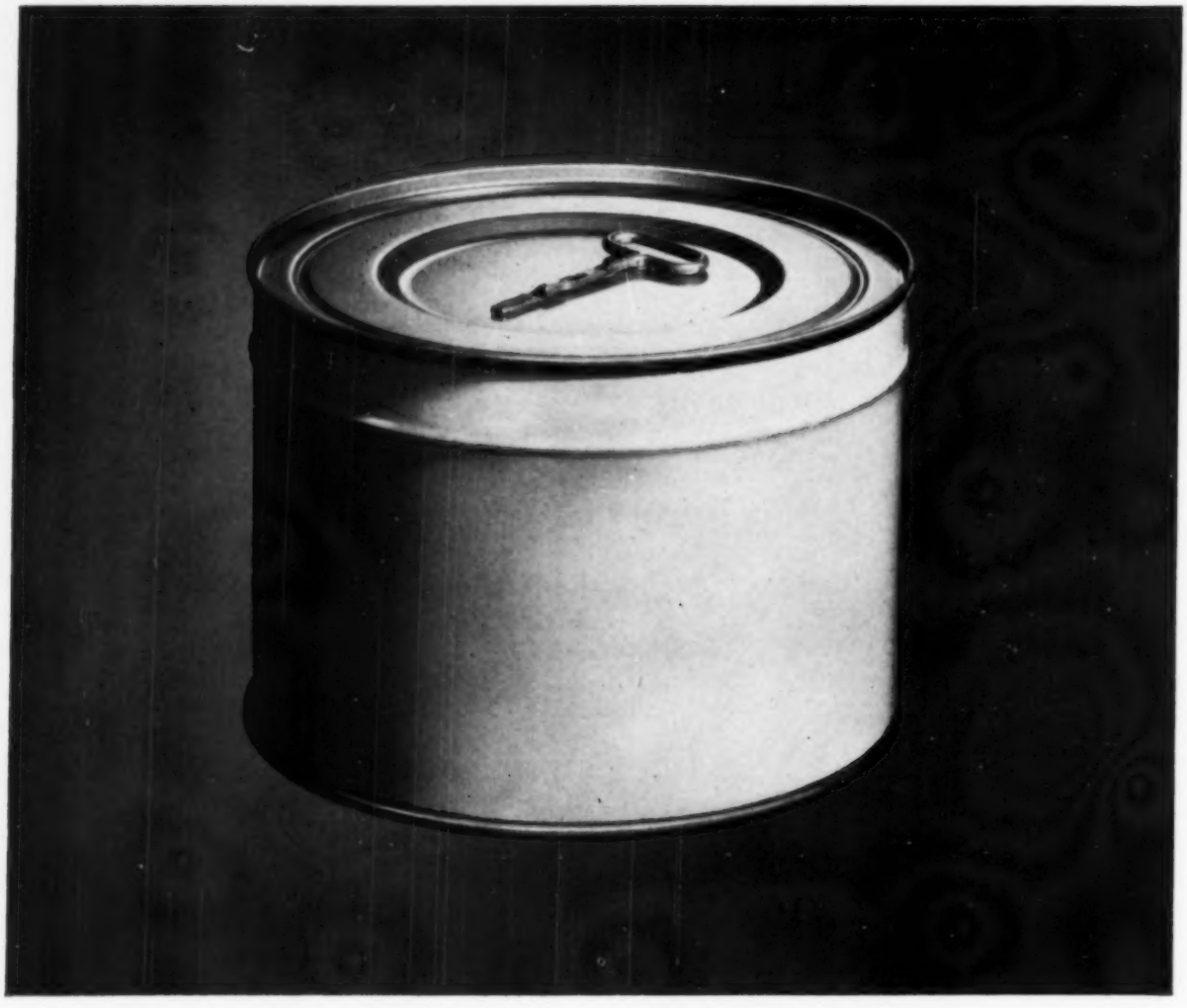

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Table 5.

Analysis Of Data Submitted In Experiment 6 For "Skips" When S. Aureus Was Used As The Test Organism

Laboratory (No.)	*No. of dil. series reported*	*No. of dil. series with skips*	*No. of dil. series with skips at widely diff. levels*	*Total no. of time skips at all dil. in all series*	*Total no. of dil. skips at all times in all series*
1	12	7	2	7	7
2	3	3	0	0	3
3	3	2	0	0	2
4	3	2	1	4	2
5	6	6	0	4	7
6	6	2	0	0	2
7	12	7	6	9	7
8	3	3	0	3	6
9	10	5	3	2	6
10	3	0	0	0	0
11	(Only final 10 min. critical killing dilution reported)				

reporter's laboratory showed that this would or would not be true depending on the individual lots of medium ingredients employed. When the "Tween 80" and the "Azolectin" have been added, following the initial instructions of Quisno, Gibby and Foter (Amer. Jour. Pharmacy Vol. 118. No. 9 pp. 320-323, 1946), no difficulties have been encountered in the reporter's laboratory in adding this mixture to the specific medium in question, FDA broth, or Brewer's Fluid Thioglycollate Medium made after the specifications of the National Institute of Health for sterility testing. No other explanation can be offered at this time for the difficulties reported. Some difficulties were reported in obtaining rings of the dimensions specified and with smooth ends. Some difficulties were also reported in preparing the test dilutions by the preheating method outlined.

Two laboratories reported that prolonged incubation periods of 96 hours tended to eliminate skips.

Three laboratories called attention to the unsuitability of the method with *E. typhosa* as a test organism.

One laboratory studied the method in considerable detail with phenol and reported that the "Letheen broth" recommended was a poor subculture medium, since a 1 to 110 phenol dilution showed killing of *E. typhosa* when this medium was employed whereas a dilution of 1 to 85 was required when the FDA broth was the subculture medium. With *S. aureus* a 1 to 80 dilution of phenol was recorded as germicidal when "Letheen broth" was employed whereas a 1 to 60 dilution was necessary with FDA broth subcultures. This observation is directly contrary to our experience in a large number of tests where the resistance of *E. typhosa* to phenol has been found to range from 1-75 to 1-85 when "Letheen broth" is employed in subculturing and from 1-85 to 1-95 when FDA broth is used in subculturing. With *S. aureus 209* the resistance range to phenol using "Letheen broth" has been found to be from 1-55 to 1-65 and with FDA broth 1-60 to 1-70.

Another laboratory conducted comparative tests using the Letheen subculture broth prescribed in Experiment 6 made from ingredients out of their own stock room and ingredients supplied by 2 other cooperating laboratories. Results of these tests clearly indicated that where the subculture medium ingredients were the same, duplicate results could be secured as between different laboratories by the procedure outlined in Experiment 6 but that where different lots of medium ingredients were employed in preparing the semi-solid, thioglycollate, "Tween 80," "Azolectin" broth different results might be obtained. This finding can be offered as the most probable explanation for the diametrically contrary results reported above when the "Letheen broth" specified in Experiment 6 was used as a subculture medium in determining the resistance of test organisms to phenol. Subsequent tests in the reporter's laboratory indicate that these differences might have been avoided through the use of a more simple "Letheen broth" for subculturing.

ON the basis of the results reported by the 11 cooperating laboratories, it would seem safe to say that the empirical method selected for Experiment 6 is, as originally outlined, unsatisfactory. No further consideration of the method using *E. typhosa* as a test organism appears to be warranted. The marked tendency toward agreement on activity levels by the majority of the laboratories where *S. aureus 209* was the test organism and the apparent ability of 4 of the 11 reporting laboratories to avoid time skips in determinations by the method outlined when *S. aureus 209* was used suggests that the procedure with minor modifications might be of value as a confirmatory test method. The factors in the test as outlined which need apparent modifications or revision appear to be:

(1) Instructions for preparing the test dilutions; (2) Instructions for uniform cleaning of test glassware; (3) Standardization of the agitation factor; (4) Revision of instructions on preparing the subculture "Letheen broth."

It would seem proper to include in this report to your Committee, at this time, brief outlines of the procedures being followed in the Insecticide Division in the routine examination of commercial quaternary ammonium germicides and of the tentative policy of the Division with regard to testing these compounds in the future.

When FDA phenol coefficient claims have appeared on the label these have been checked by the existing FDA phenol coefficient procedure and by a modified FDA phenol coefficient procedure in which "Letheen broth" was used for subculturing. The coefficient found with *E. typhosa* as the test organism and FDA broth has then been used to calculate the safe use dilution. This calculated safe use dilution and the various recommended use dilutions appearing on the label have then been used as a guide in setting up a series of "use dilution" tests similar to the one outlined in Experiment 6 with *S. aureus 209* as the test organism. These "use dilution" tests were considered as confirmative determinations. The Committee may be interested to know that this procedure has been followed rather carefully during the last five months and indicates clearly that use dilutions calculated from FDA coefficient determinations are uniformly lower and give much more consistent killing of *S. aureus* in the use dilution tests than use dilutions calculated on the basis of parts per million of quaternary or effective dilutions of the various quaternary ammonium salts reported by field investigators.

For the present, therefore, the Division will adhere basically to the FDA phenol coefficient procedure, with *E. typhosa* as the test organism. This will be considered as a presumptive test with these compounds. Two modifications of the procedure as outlined in the Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, Sixth Edition, 1945, seem desirable:

(1) Specification of vigorous shaking prior to making each loop subculture of the medicant to reduce or eliminate time skips, and (2) replacement of FDA broth with a simple "Letheen" type broth for subculturing. Tentatively then the phenol coefficient procedure to be used with quaternary germicides will be as follows:

Using Eberthella Typhosa

REAGENTS (I)

(A) CULTURE media.—(1) Nutrient broth: boil 5 g of beef extract (Difco), 5 g of NaCl, and 10 g of Armour's peptone (quality specially prepared for disinfectant testing) in 1,000 ml of H_2O 20 min., make to volume with H_2O, and adjust to pH 6.8 (Using colorimetric method, adjust broth to give dark green color with bromthymol blue.) Filter through paper, place 10 ml quantities in 20 x 150 mm bacteriological test

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tubes, plug with cotton, and sterilize at 15 lbs., pressure 40 min. Use this broth for daily transfers. (2) Nutrient agar: Dissolve 1.5 per cent Bacto agar (Difco) in nutrient broth and adjust to pH 7.2-7.4 (blue-green color with bromthymol blue), tube, plug with cotton, sterilize, and slant. (3) Letheen broth: Dissolve 5 g of "Tween 80" (Atlas Powder Co.) and 0.7 g "Azolectin" (American Lecithin Co.) in 400 ml of hot distilled H_2O, boil briefly and allow to stand. In a separate container boil 5 g Beef-extract (Difco), 5 g of NaCl, and 10 g of Armour's peptone in 600 ml distilled H_2O. Add the 400 ml "Tween 80-Azolectin" mixture and boil the combined broth for 10 min. Adjust to pH 6.8-7.0 using either colorimetric or electrometric methods. Make to volume with distilled H_2O. Filter through coarse filter paper and tube in 20 x 150 mm bacteriological test tubes in 10 ml quantities, plug with cotton and sterilize at 15 pounds pressure for 40 minutes. Use this broth for all subcultures.

(b) Test organism—The Hopkins strain of *Eberthella typhosa* (Zopf) Weldin (frequently called *Bac. typhosus*). Carry a stock culture on nutrient agar slants. Transfer once a month and incubate new stock transfer 2 days at 37° C., then store at room temperature.

From the stock culture inoculate a tube of nutrient broth and make at least 4 consecutive daily transfers (not over 30) in nutrient broth, incubating at 37°, before using culture for testing (if only 1 daily transfer has been missed it is not necessary to repeat the 4 consecutive transfers). Use 22-26 hours' culture of organism grown in nutrient broth at 37° in test. Shake, and allow to settle 15 min. before using.

(c) Phenol.—Use phenol that meets requirements of U.S.P. and has congealing point 40° or above. Use 5 per cent soln as stock soln and keep in well-stoppered amber bottles in relatively cool place, protected from light. Standardize with 0.1 N K or Na bromide-bromate soln (according to the method of Sutton[1].)

APPARATUS (II)

(a) Glassware.—1, 5, and 10 ml volumetric pipettes; 1, 5, and 10 ml Mohr pipettes graduated to 0.1 ml or less; 100 ml stoppered cylinders graduated in 1 ml divisions. Pyrex lipped test tubes 25 x 150 mm. Plug test tubes (medication tubes) with cotton wrapped in 1 layer of cheese cloth. Sterilize all glassware 2 hours in hot air oven at 180°. Place pipettes in closed metal containers before sterilizing.

(b) Water bath.—An insulated relatively deep water bath with cover having at least 10 well-spaced holes which admit medication tubes but not their lips.

(c) Racks.—May be of any convenient style. Blocks of wood (size depending somewhat on incubator to accommodate them) with deep holes are satisfactory. Have holes well spaced to insure quick manipulation of tubes; it is convenient to have them large enough to admit medication tubes while dilutions are being made.

(d) Transfer loop.—Make 4 mm (inside diam.) single loop at end of 2-3" Pt. wire No. 23 B & S gauge. Have other end in suitable holder (glass or Al rod). Bend loop at a 30° angle with stem.

PROCEDURE (III)

Make 1 per cent stock dilution of substance to be tested (or any other convenient dilution, depending on anticipated concn.) in glass-stoppered cylinder. Make final dilutions, from the 1 per cent stock dilution, directly into medication tubes and remove all excess over 5 ml. (Range of dilutions should cover killing limits of the disinfectant within 5 and 15 min. periods and should at the same time be sufficiently close for accuracy.) From the 5 per cent stock soln make 1-90 and 1-100 dilutions of the phenol directly into medication tubes. Place these tubes, containing 5 ml each of final dilutions of disinfectant and of phenol, in water bath at 20° and leave 5 min. Add 0.5 ml of the test culture to each of the dilutions at time intervals corresponding to intervals at which transfers are to be made (Thus, by the time 10 tubes have been seeded at 30-second intervals, 4.5 min. will have elapsed, and a 30-second interval intervenes before transference to sub-cultures is commenced.) Add culture from graduated pipette of sufficient capacity to seed all tubes in any one set. (As a precautionary measure the pipette should be loosely plugged with cotton at mouth end before being sterilized. Temp. of culture should be practically that of water bath before it is added.)

In inoculating medication tubes, hold them in slanting position after removal from bath, insert pipette to just above surface of disinfectant, and run in culture without allowing tip to touch disinfectant. After adding culture, agitate tubes gently but thoroughly to insure even distribution of bacteria, and replace in bath; 5 min. after seeding first medication tube, transfer 1 loopful of mixture of culture and diluted disinfectant from medication tube to corresponding sub-culture tube. To facilitate transfer of uniform drops of medication mixture, hold tube at 60° angle, and withdraw loop so that plane of loop is parallel with surface of liquid. At end of 30 seconds, transfer loopful from second medication tube to second sub-culture tube and continue process for each successive dilution; 5 min. after making first transfer begin second set of transfers for 10 min. period, and finally repeat for 15 min. period. Before each transfer heat loop to redness in Bunsen flame, remove medicant tube from bath and shake vigorously (about 6 quick shakes) and then flame the mouth of every tube. Sterilize loop immediately after each transfer (before replugging tubes) to allow time for cooling. Use care in transferring and seeding to prevent pipette or needle from touching sides or mouth of medication tube and see that no cotton threads adhere to inner sides or mouths of tubes. Incubate sub-cultures at 37° for 48 hours and read results. Microscopic examination is usually sufficient. Occasionally a 3-day incubation period, an agar streak, a microscopic examinaton, or agglutination with antityphoid serum may be necessary to determine feeble growth or suspected contamination.

CALCULATION (IV)

Express results in terms of phenol coefficient, a number obtained by dividing numerical value of greatest dilution (denominator of fraction expressing dilution) of the disinfectant capable of killing *eb. typhosa* in 10 min. but not in 5 min. by greatest dilution of phenol showing same results.

Example:

Disinfectant (*X*):	5 *Min.*	10 *Min.*	15 *Min.*
1-300	0	0	0
1-325	+	0	0
1-350	+	0	0
1-375	+	+	0
1-400	+	+	+
***Phenol*:**			
1-90	+	0	0
1-100	+	+	+

Phenol coefficient would be $\frac{350}{90} = 3.89$.

The test is satisfactory only when phenol control gives one of following readings:

Phenol:	5 *Min.*	10 *Min.*	15 *Min.*
1-90	+ or 0	+ or 0	0
1-100	+	+	+ or 0

If none of dilutions of disinfectant shows growth in 5 min. and killing in 10 min., estimate hypothetical dilution only when any 3 consecutive dilutions show following results: The first, no growth in 5 min.; the second, growth in 5 and 10 min. but not in 15 min.; and the third, growth in 5, 10, and 15 min.

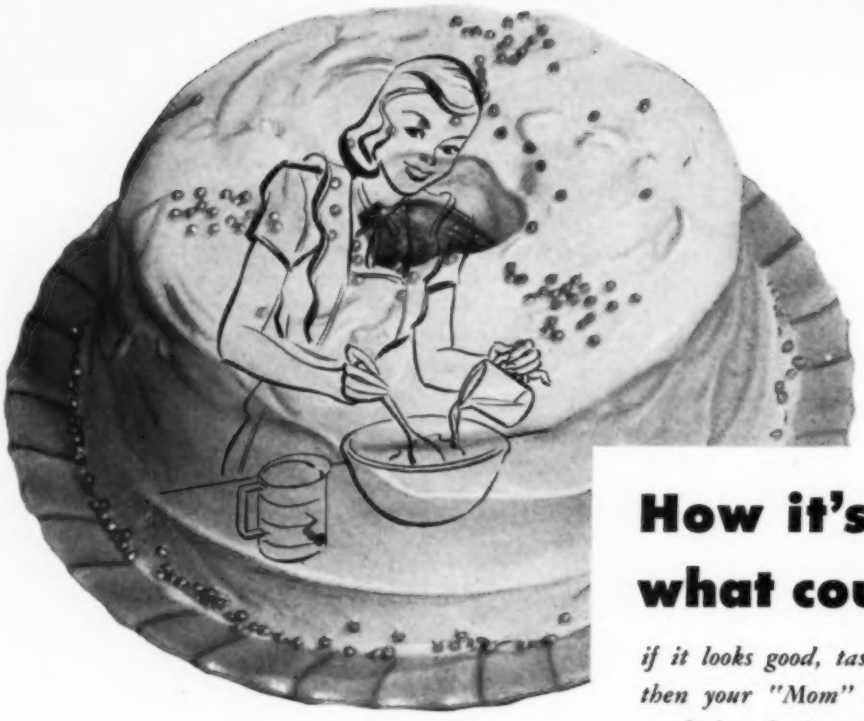
Example:

Disinfectant (*X*):	5 *Min.*	10 *Min.*	15 *Min*
1-300	0	0	0
1-350	+	+	0
1-400	+	+	+
***Phenol*:**			
1-90	0	0	0
1-100	+	+	0

Phenol coefficient would be $\frac{325}{95} = 3.42$.

To avoid giving an impression of fictitious accuracy, calculate phenol coefficient to nearest 0.1. Thus, in example cited above, phenol coefficients would be reported as 3.9 and 3.4, instead of 3.89 and 3.42.

NOTE.—The commonly accepted criterion that disinfectants for general use be employed at a dilution equivalent in germicidal efficiency to 5 per cent phenol against *E. typhosa* (that is, 20



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times the *E. typhosa* coefficient) allows reasonable margin of safety for destruction of infective agents likely to be the object of general disinfection with the exception of Dermatophytes.

Using Staphylococcus Aureus (V)

PROCEED as directed in I, II, III, and IV, except to change the phenol dilutions and test organisms. Use temperature of 20° unless otherwise directed. The culture of *Staph. aureus* must have at least the resistance indicated by the following:

At 20°	*Phenol*	*5 Min.*	*10 Min.*	*15 Min.*
	1-60	+	0	0
	1-70	+	+	+

Results by this method will be confirmed by the following use dilution test which is essentially a modification of the use-dilution procedure initially suggested by Mallman and Hanes[2] wherein emphasis is placed on consistency of complete killing with the test organism at the calculated or recommended use dilution at the 10-minute interval.

GLASS RING METHOD USING STAPHYLOCOCCUS AUREUS

REAGENTS (VI)

(a) Culture Media:—Prepare tube and sterilize as described under I (a), (1)—(2) and (3).

(b) Test Organism:—*Staphylococcus aureus 209* to be maintained and prepared for use as described under (I) (b).

Phenol:—See (I) (c).

APPARATUS (VII)

Glassware: — In addition to that listed under II (a) pyrex glass rings, 8 mm outside diameter, thickness 1.0 to 1.25 mm, 5 mm in length with cut faces ground smooth. Petri-dishes 100 mm x 15 mm each containing one sheet of sterile filter paper 90 mm in diameter. The pyrex glass rings shall be washed in the usual manner and rinsed thoroughly in water, then soaked in a 1.0 per cent solution of HCl overnight and rinsed in distilled water until all traces of HCl are removed (This usually requires about 3 rinses in a relatively large volume of water). Dry and place in cotton plugged wide mouth 300 ml Erlenmeyer flask and sterilize with the petri-dishes as specified in II (a).

(b) Water bath:—See II (b).

(c) Racks:—See II (c).

(d) Transfer hook: Make a 1 mm right angle bend at the end of a 2" No. 23 B & S gauge Pt. wire. Have other end in suitable holder. (Some of the No. 23 B & S gauge Pt. wire now available is actually too soft to make workable needles or hooks of the kind specified here.)

PROCEDURE (VIII)

Transfer 6 cleaned and sterilized pyrex glass rings into a 22-26 hour nutrient broth culture of *S. aureus 209* and allow to stand at room temperature for 30 minutes, then with the flamed Pt. hook transfer them to a sterile petri-dish containing a sterile filter paper pad, for draining and drying. Drain and dry for not less than 60 minutes, or more than 2 hours at 37° C. Rings should be placed on the filter paper pad so that they stand on one of the cut faces. Don't allow to roll. Make a stock dilution of the quaternary ammonium compound to be tested in a sterile glass-stoppered cylinder. A suitable stock solution can be made at dilutions ranging from 1-500 to 1-1,000 of the actual quaternary ammonium salt present. Place the required amount of the quaternary ammonium preparation to be tested in the cylinder first, then add 75 ml. freshly boiled sterile distilled water at 80° C., shake vigorously, allow foam to settle and bring to volume with warm sterile distilled water. Mix by inverting the cylinder 8 or 10 times, cool to 20° C. and then bring to volume at this temperature with sterile distilled water. Make final dilutions from the stock solution directly into medicant tubes and remove all excess over 5 ml. Six separate dilutions will be made at each dilution to be tested. The proper test dilution will be determined by multiplying the phenol coefficient found for *E. typhosa* under IV times 20. Place the 6 dilution tubes containing 5 ml. each of the dilution of the germicide in the water bath at 20° C. and allow them to come to temperature (about 5 minutes). Transfer with the flamed Pt hook, one of the pyrex glass rings carrying the culture of *S. aureus* 209, dried as directed to each of the 6 medicant tubes at 30-second intervals. At the conclusion of a 10-minute exposure interval with each tube remove the ring using a flamed platinum hook and transfer it to a tube of Letheen sub-culture broth. This operation can best be performed by hooking the ring a few seconds before the elapsed time interval and lightly touching it at an angle to the side of the medicant tube immediately above the surface of the medicant to remove the excess liquid, then as the time interval is concluded transferring it directly into the subculture broth. Shake the medicant tube vigorously immediately after adding the pyrex glass ring carrier to the medicant and just prior to removing the ring from the medicant. Shake the subculture broth tube vigorously immediately after the exposed test ring has been transferred therein. The test culture should show a resistance to phenol, by the phenol coefficient method, equivalent to that prescribed under V. Incubate subcultures at 37° C. for 48 hours and read the results.

If the organism is not killed in all of the 6 tests at the calculated use dilution this will be considered as indicating germicidal activity at this dilution. Additional tests will then be conducted to determine if possible at what dilution reliable germicidal activity can be expected. Increasing interest in the field of testing quaternary ammonium compounds for germicidal activity has developed much contradictory data and wide divergences in opinion relative to their actual merit as germicides. In view of this situation and the data available to us it is believed that the testing policy outlined above will serve best in protecting the consumer and the interest of disinfectant manufacturers.

In the meantime research on methods should be continued. Such basic factors as temperature and concentration coefficients should be established for these compounds, and the developmental work on use-dilution tests for confirming results obtained by the presumptive FDA phenol coefficient procedure should be continued and extended to include a variety of procedures based on commonly recommended uses. The only true criteria to the effectiveness of a quaternary ammonium germicide or any other germicide are tests made under practical conditions of use, and it cannot be accepted that any single laboratory test method will provide us with an infallible index to the efficiency of a germicide for all practical purposes for which it may be sold.

Special acknowledgment should be given to the following 11 companies that submitted the laboratory results which constitute the basis of this report:

Baird & McGuire, Inc., St. Louis, Mo.
The Dow Chemical Company, Midland, Mich.
The Emulsol Corp., Chicago, Ill.
Givaudan-Delawanna, Inc., Delawanna, N. J.
Lambert Pharmacal Company, St. Louis, Mo.
Lehn & Fink Products Corp., Bloomfield, N. J.
Merck & Co., Inc., Rahway, N. J.
Wm. S. Merrell Company, Cincinnati, Ohio
Pennsylvania Salt Manufacturing Company, Wyndmoor, Pa.
Rohm & Haas Company, Philadelphia, Pa.
Winthrop Chemical Co., Rensselaer, N. Y.

When a solution of a copper, aluminum, or zinc salt is precipitated with an alkaline solution containing soybean protein or soaps of the fatty acids, a fungicide is obtained of high toxicity. It possesses improved physical properties such as spreading, sticking, and dispersing. Such fungicides are stable chemically and are compatible with lime, oil emulsions, and organic insecticides like pyrethrum and rotenone. A. A. Nikitin, to Tennessee Copper Co. U. S. Patents No. 2,414,660 and 2,414,661.

[2] Mallman, W. L. and Hanes, Marjury. The Use Dilution Method of Testing Disinfectants. Jour. of Bact. Vol. 49, No. 5, p. 526, 1945.

SHOE POLISHES

(*From Page 117*)

In the above formula, the turpentine may be replaced by a mixture of 50 parts of turpentine and 15 parts of white spirit.

Much simpler and said to approximate the formulas of commercial products, is the following paste polish cited by Small: (17)

	per cent
Carnuba or candelilla wax	20
Beeswax	5
Turpentine	75
Dye	to suit

Employing a blend of four waxes and using a mixture of solvents is another modern paste polish listed by the same authority:

	per cent
Carnuba wax, Yellow No. 3, N.C.	5
Candelilla wax	5
Beeswax	5
Paraffin wax	10
Turpentine	10
Stoddard's Solvent	65
Dye	to suit

Another typical shoe polish, cited in Bennett's (19) new text, should serve to round out the discussion on paste products of the wax-solvent type:

	Parts
Carnauba wax	5.5
Montan wax, crude	5.5
Solubilized nigrosine base (stearate)	3.0
Ceresin	15.0
Turpentine	90.0

IN DISCUSSING emulsified paste shoe polishes, John (18) cites the opinion that better all-round results can be obtained from a well formulated emulsified shoe polish than from the more typical wax-solvent polishes. Emulsified paste polishes are perhaps not as water resistant as the older types, but this is counterbalanced by a more beneficial effect on the leather. The luster from emulsified polishes is quite equal to that obtained with solvent polishes and it is just as quickly attained. Moreover, the emulsion polishes can be prepared from a greater variety of materials and certain desirable properties, like increased water resistance, can be imparted by the inclusion of suitable ingredients, such as oils. To this may be added the fact that, as with most water-containing products, the cost factor generally favors the emulsion type polishes.

Such paste polishes may be quite simple or complex and they may be made with water or water and solvents as the diluents. An example of a polish, made with water as the sole diluting agent, is as follows: (18)

Ouricury wax	7½ lb.
Beeswax	1 lb.
Ceresin or paraffin wax	5 lb.
Potassium carbonate	1¼ lb.
Castile soap	1¼ lb.
Water	4-4/5 gal.
Nigrosine	2½ lb.

The waxes are melted and stirred together. The water is brought to the boiling point in a separate vessel and the alkali, soap and dye dissolved in it. The melted waxes are poured into the aqueous solution with stirring until nearly ready to set, when it is run into suitable containers.

More commonly, emulsion paste polishes are made with mixtures of water and solvents. A quite simple product of this kind has been suggested by Belanger, (20) as follows:

Carnauba wax	5 lb.
Ceresin wax, yellow	5 lb.
Chip, soap, white	1¼ lb.
Water	4 gal.
Turpentine	12 fl. oz.

The soap and waxes are put into a kettle with the water and heated with frequent stirring until completely dissolved. Remove from heat, cool down until the mixture begins to thicken, then add the turpentine and mix until a smooth emulsion forms. The resulting neutral shoe polish and dressing may be used on all colors of leather; providing a quick and brilliant finish. If desired, the polishing paste may be colored to suit by the use of water-soluble aniline dyes. To permit packaging in collapsible tubes, the water content of the above formula should be increased to 4½ gallons and the turpentine raised to 16 fluid ounces.

Shoe polishes made with triethanolamine are said (2) to be especially suitable for delicate leathers. A thick flowing paste of this sort may be made from:

	Parts
Carnauba wax	85
Stearin	9
Triethanolamine	4
Water	400

The stearin is melted down and the triethanolamine, dissolved in hot water, is added at about 70°C. and then the mixture is stirred and heated to 100°C. The melted wax, heated to 80-90°C. is stirred into the solution; stirring being continued until the mass has cooled.

Illustrative of the use of newer types of emusifiers is the following shoe polish stabilized with glyceryl monostearate: (21)

	Parts
Montan wax	14
Candelilla wax	5
Carnauba wax	3
Ceresin or microcrystalline wax	5
Glyceryl monostearate	6
Water	45
Turpentine	35
Varnolene	40
Oil-soluble dye	sufficient

Melt all the waxes and the monostearate together with moderate heat. Add the solvents and dye and stir thoroughly. Heat the water to boiling and add to the wax solution. Stir until cool enough to pour and pack.

The use of wool grease in emulsion shoe polishing pastes is illustrated by John (18) in the following formula:

Ouricury wax	15 lb.
Ceresin	6 lb.
Paraffin wax	6 lb.
Potassium carbonate	2½ lb.
Castile soap	2½ lb.
Water	12 gal.
Nigrosine	7 lb.
Wool grease	6 lb.

The wool grease, melted separately, is incorporated by stirring it into the hot, completed polish. In addition to its pronounced emulsifying properties, the added wool grease will be found to greatly improve the waterproofing qualities and also assists the ease of rubbing of the polish.

EMULSION type shoe polishing creams do not differ greatly from paste polishes except in the matter of consistency. By increasing the liquid content and by suitable adjustment in the formulas, paste products can often be made into creams and thin liquids. Cream polishes should have a consistency that permits packaging in collapsible tubes.

Emulsion creams are frequently prepared as neutral polishes for use

on all colors of leather. They can, of course, be tinted readily by the addition of suitable dyes. Typical of such products is the following neutral cream polish: (17)

	per cent
Carnauba wax	10
Beeswax	3
Paraffin wax	10
Potash soap	3
Turpentine	15
Stoddard's Solvent	12
Water	47

The waxes are melted and stirred together and the solvents added. Separately, the water is heated to boiling, the soap is dissolved in it, and then the wax-solvent mixture poured into the boiling soap solution. Stirring is continued until the mixture is nearly ready to set, when the product is run into collapsible tubes.

Somewhat more complex, but made in the same way, is the following black emulsified shoe cream: (18)

Ouricury wax (refined)	7 lb.
Beeswax, natural	4 lb.
Paraffin wax	8 lb.
Rosin	3 lb.
Solubilized nigrosine base (stearate)	1 lb.
Castile soap	3 lb.
Potassium carbonate	1½ lb.
Nigrosine, water-soluble	4 lb.
Water	7-1/5 gal.

Eliminating the use of soap and alkali through the use of diglycol stearate as the emulsifier is the following method (19, 22) for making a white neutral cream that applies easily and rubs to a high gloss:

	Parts
Carnauba wax	6 parts
Ceresin wax	3 parts
Candelilla wax	3 parts
Turpentine	5 parts
Lemongrass oil	½ part
Light mineral oil	1 part
Diglycol stearate	5 parts
Water	100 parts

Heat the waxes, oils and the stearate together below 90°C. and stir until clear. Pour slowly while stirring with a high speed mixer into the boiling water. Stir until the temperature falls to 70°C. If a paste polish is desired, this formula may readily be adjusted by reducing the water content to about 50 to 60 parts. To color the polish, an aniline dye is dissolved in the water.

Methods for incorporating lanolin into polishes are given in a foreign patent. (23) In the process, wax is melted, saponified by alkali, and water and lanolin are then added. Various dyes and fillers (e.g. resins, casein) may be added to the water.

LIQUID emulsion polishes may be described as thinner polishing creams. Liquid polishes are more easily applied than paste polishes and do not require as hard buffing to yield a high gloss. Production of liquid polishes follows the lines of other emulsion polishes except that they have a higher liquid content. Sometimes referred to as "water polishes," the procedure for making such a product has been outlined in a Government publication (24) as follows: Dissolve 1 part of castile soap in 16 parts of soft water and heat the solution to boiling. With constant stirring, add 4 parts by weight of a good grade of carnauba wax or other suitable wax, previously cut into small pieces. When a smooth homogeneous emulsion is obtained, cool to 135°C. by quickly adding, with constant stirring, from 14 to 16 parts of water. Let cool, filter through cheese cloth and stir in about 0.5 per cent of formaldehyde as a preservative. A thicker or thinner product may be made by decreasing or increasing the quantity of water used; taking care to maintain the given ratio between the soap and wax. The polish may be colored by thoroughly stirring in a strong solution of a suitable water-soluble dye.

Triethanolamine is frequently employed in the formulation of liquid creams. Easily applied, such polishes may be compounded so as to remove dirt and grease and yield a bright, hard, water-resistant finish. An example of such a polish is given (25) in the following basic formula, to which suitable dyes may be added if desired:

	Parts
Carnauba wax	12.0
Beeswax	6.0
Naphtha	70.0
Triethanolamine	4.8
Stearic acid	8.0
Water	180.0

Melt the waxes and stearic acid, add the triethanolamine, and maintain the temperature at about 90°C. Add the naphtha slowly and stir until a clear solution is obtained and the temperature is 90 to 95°C. Avoid the use of open flames. Heat the water to boiling, add it to the naphtha solution, and stir vigorously until a good emulsion is obtained. Continue stirring slowly until the emulsion has cooled to room temperature.

Liquid polishes which dry bright with little or no buffing are increasing in popularity. Older products of this type consisted largely of simple solutions of shellac in alcohol or in ammonia or borax solutions, with a suitable dye added. According to Small, (17) the modern successors to such compositions are essentially similar to self-polishing floor waxes, having the same properties of easy application and requiring no buffing. A typical formula given by this authority is as follows:

	per cent
Carnauba wax	10
Soda-rosin soap	2
Shellac or other resin	1
Dye	1
Water	86

If shellac is used it must be dissolved separately in water made slightly alkaline; the water used for this purpose being deducted from the total.

Details for making much more elaborate dry-bright wax emulsion shoe polishes are given in John's (18) text. Other self-lustering shoe polishes have been patented. (26)

Although neutral polishes are frequently employed for cleaning and glossing patent leather shoes and leather products, special compositions may be prepared for these purposes. Thus, a rather simple patent leather cleaner may be made from: (24)

Castile soap, granulated	4 oz.
Water	1 gal.
Alcohol, denatured	2 qt.
Ammonia water (S.G. 0.90)	16 oz.

Dissolve the soap in the water with the aid of heat. Allow to cool and add the alcohol and then the ammonia. Mix well.

Where a patent leather polish is desired, a product may be made along the following lines: (19)

Yellow wax or ceresin	3 oz.
Spermaceti	1 oz.
Turpentine	11 oz.
Asphaltum varnish	1 oz.
Borax	80 gr.
Frankfort black	1 oz.
Prussian blue	150 gr.

Melt the wax, add the borax, and stir until smooth. In another vessel, melt the spermaceti; add the varnish, previously mixed with the turpentine. Stir well and add to the wax-borax mixture; finally add the colors.

It is common practice, and a good procedure, to clean shoes prior to the application of the polish. The usual type of cleaners are mixtures of gum karaya and water, with soap sometimes added. Water and mechanical action do the actual cleaning, while the gum serves to thicken the mixture so that it will cling to the brush.(17) Most such cleaners are colored with dyes. Of interest in this connection is a recently patented (27) shoe dressing capable of removing accumulated layers of polishes, dirt and dark spots without affecting the tannery finish. The dressing contains up to 10 per cent of a mixture of shellac and an oil-soluble phenol-formaldehyde resin dissolved in 10 to 30 per cent of a volatile non-hydrocarbon solvent. The rest of the composition consists of a diluting cleaning vehicle such as a compatible volatile liquid hydrocarbon or a chlorinated hydrocarbon.

From this indicative review, it should be evident that colored shoe polishes offer considerable interest to manufacturers of sanitary products like floor polishes, furniture polishes, and similar items. Raw materials and production methods have much in common and it should not be difficult to add shoe polishes to the line.

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TESTING DAIRY QUATERNARIES

(*From Page* 129)

is given by the phenol coefficient values as determined by the Food and Drug Administration method.

2. While the method here described is basically not new, it involves the use of newer procedures such as the use of a hand homogenizer and the spectrophotometer.

3. Organisms like *E. coli*, *S. aureus*, thermophilic type, and vegetative cells of *B. cereus* are readily killed by quarternaries.

4. Quaternaries appear to have no greater effect on spores of *B. cereus* and thermoduric types than old types of germicides.

5. Quaternaries are highly bacteriostatic to sporeformers.

6. On a dry basis approximately 0.3 per cent of either cow manure or non-fat milk solids will produce the first significant decrease in germicidal potency of a 200 p.p.m. quaternary solution.

7. When 200 p.p.m. of quaternary solution is used as an udder wash under normal conditions, approximately 30 to 40 cows can be washed before the germicidal potency of the solution is decreased to a point where a fresh solution is needed. No chapping or cracking of udders, teats or milkers' hands were noted when this concentration of quaternary was used for a period of 4 weeks during the winter.

8. Dual purpose powders as cleaner-sanitizer combinations have considerable merit.

9. A quaternary spray treatment for milk cans showed a significant reduction in counts.

10. Metal parts of dairy equipment that have been properly washed can be effectively sanitized by the use of a solution of 200 p.p.m. of quaternary.

11. A 400 p.p.m. quaternary solution is not effective in sanitizing the rubber inflation tubes of teat cups between each cow milked when the cups are dipped rapidly in and out of the solution, which is a common practice.

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The preparations contain as an essential ingredient a halogen-substituted naphthoquinone such as the dichloro compound, and a carrier suitable for converting the preparation into a spray. The compounds are used as fungicides, insecticides, and insect repellents. U. S. Rubber Co. British Patent No. 568,174.

TECHNICAL Briefs

From Current Literature in the Sanitary Products Field

Mosquito Control

Results of field tests with DDT-oil aerosols dispersed by a ground machine for the rapid control of adult mosquitoes over large areas are reported. The method is effective for adult mosquitoes in the field, and for adult anophelines in tree holes, hollow logs etc. It should prove applicable to general insect control. A dosage of 15 gallons of a mixture containing 50 parts of oil and 50 per cent water emulsion by volume, the DDT equaling 10 per cent of the weight of the oil, suffices for 1000 feet of front and 1 mile in depth, down wind, under favorable conditions. The best particle size for adults is 10 microns regardless of wind velocity and terrain. Aerosol clouds that hang within 15 feet of the ground generally give best results. F. Brescia et al, *J. Econ. Entomol. 39*, 698-715.

Mildewproof Paint

The most important cause of failure of fungicides when used in a protective coating is a lack of balance between the sealing-in effect of the protective coating and the leaching ratio of the fungicide. The mercurials are very effective, particularly the phenyl mercurials; as little as 0.02 per cent of mercury by weight in paint provides immunity against mildew growth for 5 years. The use of mercury salts is hazardous, owing to their solubility in water. Insoluble phenyl mercury naphthenate is a safer fungicide. Only 0.05 per cent by weight in lacquer is needed to prevent mildew formation entirely. Toxicity tests show that 0.2 per cent of mercury in this form in enamel can be used without health hazards. A. Minich and M. Goll. *Paint, Oil Chem. Rev. 109*, No. 24, 6-7, 36-7.

DDT Determinations

When boiled under reflux with Normal alcoholic alkali, *p,p'*-DDT loses slightly more than 1 gram-ion of chloride per molecule, indicating that the reaction is not one of simple dehydrohalogenation. This was confirmed by the isolation of bis- (*p*-chlorophenyl acetic acid. The results indicate that by boiling *p,p'*-DDT with Normal alcoholic alkali, the acid can be formed directly by a hydrolysis of $-CCl_3$ to $-COOH$ with consequent liberation of three chloride ions per molecule, and that DDT is not an intermediate product of the reaction.

The action of Normal and 0.1 Normal alcoholic alkali on *p,p'*-DDT at lower temperatures appeared to be one of simple dehydrohalogenation, and it is suggested that such milder treatment will enable more accurate estimation of this isomer than the procedure recommended before. R. L. Wain and A. E. Martin. *Analyst 72*, 1-6 (1947).

Cationics Inactivated

When bacteria are first treated with anionic compounds such as soap or sodium dodecyl sulfate, this delays the action of cationic germicides such as alkyl dimethyl benzyl ammonium chloride. It is suggested that the surface-active cations first combine with surface-active anions on or in the bacteria. This portion of cations is thus inactivated. Only when excess cations penetrate the bacteria will inhibition result. A. S. DuBois and Di. D. Dibblee, *J. Bact. 53*, 251-2 (1947).

Toxicity of DDT

Sprays of commercial solutions of 2-5 per cent DDT twice daily during a period of 3 months were not toxic to rabbits. Daily intraperitoneal injections of 2.5-10 cc. of 2 per cent DDT caused loss of weight in rabbits, spastic paralysis, and histopathologic changes in the lungs, liver, and kidneys but not in the nerves. Animals died in paralysis. Intravenous injection of 0.5 cc. of 20 per cent DDT solution caused temporary hypertension and increased the amplitude and frequency of respiration of a dog. C. Jimenez-Dias. *Med. colonial* (Madrid) 9, 51-74 (1947); through *Chem. Abs.*

Shoe Polish

Really successful shoe polishes are not frequently encountered, especially in comparison with the far more numerous polishes of other kinds such as furniture, floor wax, and car polish. This need not be so if due care is taken with laboratory formulation and batch control. Selection of raw materials is important. Foremost among the true polishing waxes is carnauba, which can be mixed with other waxes, as in the following formula for a paste shoe polish:

	parts by weight
Carnauba wax, gray ..	8
Ozokerite	4
Beeswax, yellow	6
Paraffin wax, melting 48-50° C.	14
Nigrosine, soluble	sufficient
Turpentine or substitute	68

The waxes have been selected for their characteristic properties to give a well balanced paste.

Solvents liable to attack artificial leather should be avoided, in particular high proportions of nitrocellulose solvents, softeners such as acetone, and solvents for vinyl polymers such as ethyl acetate. Citronella, sassafras, spike, lemongrass, and pine oils are useful perfumes, also bornyl acetate, ben-

zyl acetate, amyl acetate, and amyl salicylate. J. M. Vallance *Manufacturing Chemist 18*, 271-6 (1947).

Athlete's Foot Compound

Clinical work on the treatment of athlete's foot has shown the effectiveness of the copper and zinc salts of fatty acids, such as caprylic, propionic, and undecylenic. The last acid is a wax-like substance of low melting point with a peculiar, persistent, but not unpleasant odor. Its zinc and copper salts are white and blue green, respectively. They are insoluble in water but miscible with warm fats and oils.

Incorporation of copper and zinc undecylenates in emulsion bases is somewhat difficult, owing to the ease of breakdown of an oil-in-water emulsion. A stable smooth preparation can be made, however, by using 2 per cent of bentonite as a stabilizing agent. Liquid paraffin must be used in a 4:1 ratio to the fungicidal salt. The latter should be present to the extent of 5 per cent. A small amount of free acid can be incorporated if desired, without affecting the stability of the emulsion. A suitable formula is the following:

	parts by weight
Bentonite	2
Lanette wax SX	5
Liquid paraffin	25
Hard paraffin	3
Zinc or copper undecylenate	5
Water	to 100

Melt the hard paraffin in the liquid paraffin and add the undecylenate. When dissolved add the Lanette wax SX. Prepare a gel of the bentonite in hot water and mix the two liquids. Shake or homogenize until cool. A. Axon, *Pharm. J. 158*, 396 (1947).

Soap in Plant Sprays

Spray compositions with fungicidal properties consist of a water-insoluble solid organic plant protectant suspended in water, a small quantity of a water-soluble salt such as an iron or aluminum salt, and a sufficient quantity of a soap or soap-like material to flocculate the plant protectant and to give the mixture a pH of 5-9. C. D. Dolman, to Hercules Glue Co. U. S. Patent No. 2,412,720.

Sanitizing Efficiency

The germicidal speed of four quaternary ammonium compounds was compared with that of two hypochlorites against *S. aureaus, B. panis,* (vegetable cells and spores), *M. Candidus,* cheese starter organisms, *E. coli,* and *P. aeruginosa,* by use of the glass-slide technique originally devised for comparing chlorine sterilizing agents.

Against Gram-positive species, the quaternary compounds were generally more effective than the hypochlorites; against Gram-negative species, the reverse held true. Cheese starter organisms were an exception, being killed faster by the hypochlorites. Three of the four quaternary compounds were closely comparable in efficiency, while the fourth was definitely slower. The hypochlorites responded much more readily to favorable adjustments in pH and temperature than did the quaternary compounds.

Some bacteriostatic effect was observed with higher concentrations of all four quaternary compounds, but the results were not significantly affected thereby. The glass-slide technique appears to offer many advantages in evaluation of sanitizing products for food processing plants. C. K. Johns, *Can. J. Research 25F*, 76-91 (1947).

Repellency Studies

A laboratory test for the systematic evaluation of fly larvicides for use in the treatment of myiasis is made as follows: 15 maggots of this fly are placed in 20 cc. of a culture medium containing agar, a pad of raw wool is then pressed on the surface of the medium, and the culture is sprayed with 5 cc. of the toxicant solution. The number of larvae leaving the culture gives a measure of the repellency of the spray; the number of larvae dying in 2 and 12 hours in the culture measures the rapidity of death of the unrepelled larvae; the number of larvae dying in the unsprayed container in which the culture is placed measures the delayed mortality occurring after repellence. A new blowfly repellent contains a mixture of Carbitol acetate 20 per cent, Plastol (polymerized butylene) 50 per cent, and methallyl disulfide 30 per cent. This possesses considerable larvicidal as well as effective repellent action. E. S. Loeffler and W. M. Hoskins. *J. Econ. Entomol. 39*, 589-97.

Paints Containing DDT

Five types of paints containing DDT (70 per cent *p,p*^{1}*-isomer*) *were* tested for insecticidal activity against houseflies. The most effective mixtures are a glossy enamel containing 20 per cent of DDT and a flat oil paint with 3-5 per cent of DDT. Good results were also obtained with an emulsion-type paint with 2 or 5 per cent DDT. Slight activity is found in a water paint with 1 per cent of DDT, and an ordinary oil paint with 5 per cent of DDT. The activity of the oil paints depends on the extent to which DDT is crystallized in the film. One factor in inducing crystallization appears to be the presence in the paint prior to application of more DDT than that required to saturate the paint solvents. D. Gilmour, *J. Council Sci. Ind. Research 19*, 225-32.

Air Disinfection

Triethylene glycol in excess of saturation, introduced as a vapor into a cloud chamber in which a dynamic cloud of either *meningopneumonitis* virus or *psittacosis* virus existed, caused a distinct reduction of virus, as measured both by cloud sampling—which showed an average of 62 per cent reduction—and by exposure of mice to the cloud, which showed an average of 73 per cent reduction. The relative humidity in the chamber was 35-60 per cent. T. Rosebury, G. Meiklejohn, L. C. Kingsland, and M. H. Boldt. *J. Exptl. Med. 85*, 65-76 (1947).

Textile Rot Prevention

The textile material is immersed in two aqueous baths, one containing a water-soluble salt of naphthenic acid, the other a water-soluble salt of copper, zinc, or chromium. After the second immersion the material is washed with water and dried at a temperature not over 200° F. The treatment is particularly adapted for preventing fungus attacks. R. H. McKee, to W. O. Duncan. British Patent No. 568,679.

TRADE NEWS . . .

New West Chicago Plant

West Disinfecting Co. expects to take possession of its new $300,000 Chicago plant in the Central Manufacturing District, on Kedzie Ave., on Oct. 1. Meanwhile the 3-story building at 2635 Cottage Grove Ave., which the company has occupied for many years as Chicago headquarters, has been sold for $100,000, it was recently announced.

Lowers DDT Price

Monsanto Chemical Co., New York, announced a reduction of five cents a pound in its price schedule for DDT effective August 4th. Monsanto has been manufacturing DDT at its Queeny Plant in St. Louis, Mo., since June 1944, but with the initial operation of new and larger facilities for the manufacture of DDT as well as chlorine and sulfuric acid at its Monsanto, Ill., plant, lower costs are anticipated. The new prices for Monsanto's DDT marketed as "Santobane" are 37½ cents per pound for minimum carlots and over, 40 cents for lots of 2000 pounds, both prices inclusive of 100-pound fiber drums; 43 cents per pound for less than 2000 pounds in 100-pound fiber drums; 48 cents for less than standard containers f.o.b. Monsanto, Ill.

Clean Sweep Co. Moves

Clean Sweep Janitor Supply Co. is now located at 41 S. Madison St., Battle Creek, Mich. Under a recent reorganization Wm. Brooks, Jr., and Richard C. Beckett, Jr., have assumed active management of the firm, while W. E. Brooks, Sr., remains as advisor.

Sells Janitor Supply Firm

Hugh V. Remington of Elmira, N. Y. recently reported that he had sold the janitor supply part of his business, Vasco Products Co., Elmira, and retained the pest control service part of the organization from which he has formed the new firm, Vasco Exterminating Co., Elmira. He reports that the new owners of Vasco Products Co. have not changed the address of the company.

DONALD DEAN

Peterman Appoints Dean

Donald Dean was recently appointed general manager of William Peterman, Inc., Newark, N. J., a subsidiary of Bristol-Myers Co., Hillside, N. J., according to an announcement by the parent company. Mr. Dean was with another Bristol-Myers subsidiary, the Rubberset Co. before joining the insecticide manufacturing firm.

Harry Bell Forms Company

Harry E. Bell recently formed a new company, Harry E. Bell Associates, Long Island City, which will act as manufacturers' sales representatives in the sanitation and floor maintenance supply field. The new organization will cover the hardware, paint, janitor and restaurant supply houses in the eastern market. Mr. Bell recently resigned from his position as general sales manager, American Steel Wool Mfg. Co., Long Island City, N. Y., where he had been located for the past twelve years.

Rasmussen's New Duties

H. B. Rasmussen, formerly manager of the Chicago office, J. T. Baker Chemical Co., recently established headquarters at Phillipsburg, N. J., where he is taking up his new duties as sales manager of the laboratory chemicals division.

Future NSSA Meetings

The National Sanitary Supply Association recently announced dates of regional meetings to be held this fall. The southern regional meeting is to be held October 9th and 10th at the Atlanta-Biltmore Hotel, Atlanta, Ga. In charge of the event are Erwin Zaban, of Zep Mfg. Corp., regional vice-president and John Walsh, Tesco Chemical Co., chairman of the meeting. Arrangements have been made for tickets to a football game between Georgia Tech and Virginia Military Institute on Oct. 11 reports Mr. Leo J. Kelly, executive vice-president of NSSA.

The western regional meeting of the association will be held Nov. 12 and 13th, Roosevelt Hotel, Hollywood Calif. No dates or hotels for the eastern meeting have yet been announced. The association's national convention will be held next spring, April 18th to 21st, 1948, at the Morrison Hotel, Chicago.

Flag Sulphur Expands

Flag Sulphur and Chemical Co., Tampa, Fla., recently announced the acquisition of the sulphur grinding and insecticide blending plant at Tampa originally owned by Schnarrs, Inc. W. Mercer Rowe, Jr., formerly assistant sales manager, agricultural division, Pennsylvania Salt Mfg. Co., Philadelphia, is vice-president of the new organization.

NPCA Meets Oct. 27-29

The fall meeting of the National Pest Control Association, Brooklyn, will be held at the Bellevue-Stratford Hotel, Philadelphia, October 27 to 29, 1947.

Elgo Trading Corp. Moves

Elgo Trading Corp., New, York, recently announced a change of address that became effective August 15th. The company is now located at 220 Broadway, New York 7, N. Y.

Koppers Adds Two Offices

The chemical division of Koppers Co., Pittsburgh, announced Aug. 12th the formation of an eastern sales district with headquarters in New York, and a western sales district with offices in Chicago. The eastern district will handle sales in New England, the middle Atlantic States, eastern New York, and the eastern one-third of Pennsylvania. The western district will cover most of Michigan, all of Indiana, and the States due west of these two as far as the Rocky Mountains. R. C. Whitman was appointed eastern district sales manager. He has been eastern representative of Pennsylvania Coal Products Co., Petrolia, Pa., a former Koppers subsidiary which was recently made a department of the Koppers chemical division. Appointed as western district sales manager was George D. Bieber, who joined the research department of Koppers in 1941 after teaching at the University of Pittsburgh and doing special work at the Mellon Institute of Industrial Research. He was transferred to the company's tar products division in 1944.

Starts Business Paper

A new publication, "New York Business" will soon be published by the New York Board of Trade, Inc., New York. It will have as its objects: (1) Review and analysis of all legislation affecting business; (2) Combatting all unreasonable government regulation of business; (3) Giving voice to the views of management; (4) Furthering the interests of all branches of New York business; (5) Attracting business to New York; (6) Publicizing the advantages of doing business in New York.

Markets New Cleaner

A new industrial or household hand cleaner under the brand name of "Norcotex" is being marketed by Norco Products Co., Philadelphia. The new product is said to be effective for removing dyes, paint, grease, dirt or duplicating ink without the use of water. As a general household aid, when diluted with water, it is said to clean painted surfaces, glass, metal, wood, linoleum and fabrics. As an industrial cleaner, it is recommended for the removal of wax finishes, rubber burns and heel marks from all types of flooring surfaces. It is also recommended as an additive for use in home and industrial laundry machines as well as dishwashing equipment. Norcotex is available as an amber transparent paste or liquid. It is non-inflammable, non-separating, and has a pH of 7. It is said to form a clear, mildly foaming solution with water.

Attapulgas Clay Co. Moves

Attapulgus Clay Co. recently moved its research laboratory into new modern quarters at Airport Circle, Camden, N. J. The space now occupied is almost three times greater than the previous quarters. In addition to the laboratory the building contains extensive office space and a large storage area. There is also a reference library.

NSSA Publicity Campaign

A nation-wide publicity campaign, recently announced by the National Sanitary Supply Association, Chicago, is being directed to the buyers of sanitary chemicals, equipment and janitor supplies in order to bring to the attention of the market an assurance of confidence associated with houses and products displaying the Association emblem. Advertisements in the September issues of several trade magazines will be the first step in the Association's program.

Wm. Cahill Dies

William Cahill, Sr., Elizabeth, N. J., formerly an engineer with Orbis Products Corp., Newark, died July 29th at the Alexian Brothers Hospital, Elizabeth, after an illness of several weeks. He was 67. He leaves a widow, Mrs. Mary Joyce Cahill; two sons, William Cahill, Jr., and John Cahill; and three daughters, Mrs. Joseph Petete, Mrs. John Berry and Miss Loretta Cahill, all of Elizabeth, N. J.

Hukill Chemical Formed

Hukill Chemical Corp., has recently been formed as a sales organization in Cleveland to handle specialized industrial chemicals and resins. Emory G. Hukill, Jr., president and general manager, a chemical engineer from Case Institute of Technology, was formerly with the Harshaw Chemical Co., Cleveland and later sales manager of Special Chemicals Co., New York. Nelson Sharpe, is vice-president and secretary. Walter H. Lamprecht, Jr., is vice-president and treasurer. Hukill Chemical Corp., is presently engaged in making contacts with producers of specialized industrial chemicals, both inorganic and resinous organic, desiring representation in Ohio, and surrounding territory.

O-Cedar P.A. Dies

Wm. C. Arterburn, purchasing agent for O-Cedar Corp., Chicago, died Aug. 10 at the age of 55 years.

Vestal Adds Plant Space

A new plant addition recently completed by Vestal Laboratories, Inc., St. Louis, adds 11,000 square feet of manufacturing area to its facilities. A new wing of insulated, fireproof construction has been equipped with radiant heating and high density lighting. Also included in a $150,000 expansion program are increased research laboratory and pilot plant facilities for the development of new products.

Reports New DDT Analog

A new chemical insecticide called methoxychlor, said to be 1/40th as toxic to warm blooded animals as DDT, was reported by Dr. W. H. Tisdale, director of the pest control research section, Grasselli chemicals department, E. I. duPont de Nemours & Co., Wilmington, speaking at a meeting of the International Apple Association in Detroit on August 12th. Methoxychlor, technically called bis (methoxyphenyl) trichloroethane, an analog of DDT, is being manufactured in limited quantities by the du Pont Co. Dr. Tisdale claims that there should be no toxic danger involved in the use of this product on fruit and vegetable crops. It is said to be superior to DDT for the control of flies and Mexican bean beetles but not equal to DDT for the control of the codling moth. Preliminary indications show that the new insecticide will control most of the pests on fruit crops than are controlled by DDT.

Fairfield Acquires Rhodes

Rhodes Chemical Corp., Philadelphia, manufacturing for the past four years a complete line of quaternary ammonium compounds, was recently acquired by Fairfield Laboratories, Inc., Plainfield, N. J. The Fairfield Co., for the past 15 years has been engaged in the manufacture and distribution of pharmaceutical specialties. Wellington Rounds, president and general manager of Fairfield, will serve in the same capacity in the Rhodes organization. Production and laboratory research at the Philadelphia plant will be in charge of William S. Shibe, chief chemist. The Industrial Toxicology Laboratories, Inc., formerly Smyth Laboratories, Philadelphia, under the direction of Dr. Herman Shelanski, have been retained to conduct independent research with respect to the various quaternaries manufactured by Rhodes. Rhodes Chemical Corp. will continue to sell quaternary concentrates to manufacturers. Among these are "Rodalon," "Cetab," "Ethyl Cetab," "Decab," "Ethyl Decab," "Octimet," "Cetylon," and "Octab." Special formula preparations are to be manufactured and distributed by Fairfield Laboratories. Fairfield Laboratories are distributing Rodalon 10% (alkyl dimethyl benzyl ammonium chlorides), a combination detergent and sanitizer, and a concentrated non-ionic detergent.

Rotenone Resin Booklet

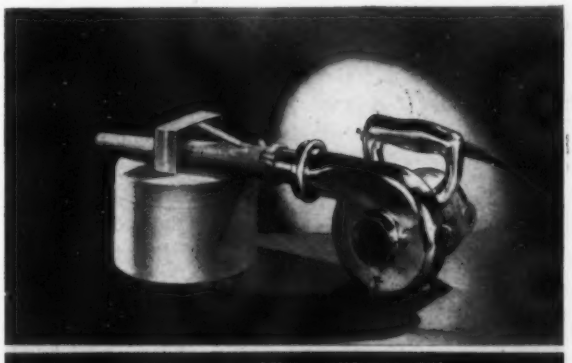
A six-page two-color booklet describing "Orbiscide" brand rotenone resins for the manufacture of household insecticides and specialty rotenone products as well as agricultural sprays, was released in August by the insecticide sales division, Orbis Products Corp., New York. The Orbiscide booklet gives a description of rotenone resin and methods of its application. Orbis, it is explained, has been extracting the insecticidally active ingredients from rotenone-bearing roots since 1932. The booklet also sums up the advantages of rotenone resin with respect to activity, convenience, economy, safety to human beings, and lack of residue. Formulas for preparation of oil concentrates and garden sprays are given.

Koppers Names Hosford

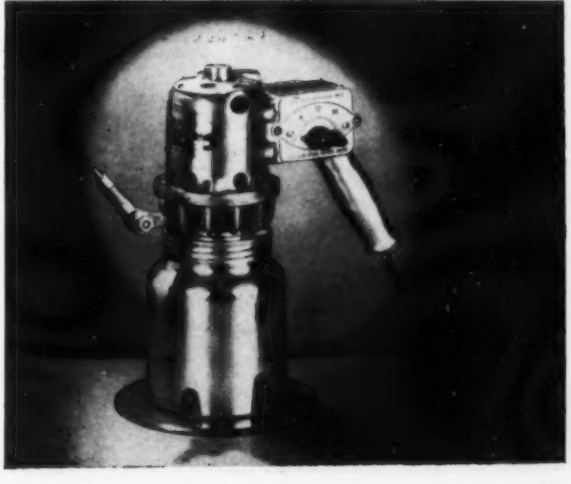
Charles F. Hosford, Jr., president of Pennsylvania Coal Products Co., Petrolia, Pa., until its recent consolidation with the chemical division of Koppers Co., Pittsburgh, was appointed a vice-president in the Koppers chemical division, it was announced July 25th. Mr. Hosford will continue active relationship with the Petrolia plant as manager of the company's Penn. Coal Products department. The previously wholly owned subsidiary of Koppers became a department of the company on June 30th of this year.

Glyco Starts New Plant

Initial production of monochlorobenzol and ortho- and paradichlorobenzol at the former Chemical Warfare Services' Marshall Plant at Natrium, W. Va., was recently announced by Glyco Products Co., Brooklyn. The plant was leased several months ago to Glyco and additional products are scheduled for production as soon as other processing units can be activated.



These two new "Mistmaster" electric insecticide sprayers were recently announced by Sprayer Corporation of America, Evanston, Ill. The fan-type portable electric sprayer is equipped with a one-gallon, non-corrosive tank, and sprays under low pressure with a high volume of air.



Below the fan-type sprayer is pictured the company's new vane-type compressor sprayer which incorporates a process of drawing the liquid into the compressor and mixing it with air, securing a more complete breaking up of the insecticide for better diffusion. The sprayer is equipped for adjustment of spray particle size and has an automatic time switch.

Discuss Regulations for Federal Insecticide Act at Washington Hearing

A PUBLIC hearing was held by the Department of Agriculture, Washington, August 25th, on the proposed regulations for the enforcement of the new Federal Insecticide, Fungicide and Rodenticide Act in order that the department might become acquainted with the criticisms of industry and make necessary changes in the text prior to issue.

At the hearing presided over by W. G. Reed, chief, insecticide division, livestock branch, USDA, a statement was read by Harry E. Reed, director of the livestock branch, to the effect that although the new law might be interpreted to include all advertising copy as well as labeling claims of economic poisons under USDA jurisdiction, the matter of advertising as covered in the FTC act, would be left for the attention of FTC rather than to USDA. More than one objection by industry was recorded to any intent of the legislation to include advertising.

The tentative regulations provided for four classifications to indicate different degrees of hazard, using the signal words "POISON," "DANGER," "WARNING" and "CAUTION." The "POISON" label would be required on all economic poisons highly toxic to man. The "DANGER" signal would be required on all economic poisons which (1) produce a significant number of deaths in "any common laboratory animal" at a dosage of 50-100 milligrams per kilogram of body weight when administered orally or (2) produce serious impairment of health in any laboratory animal at a dosage of 100-300 p.p.m. of gas or vapor, administered by continuous inhalation for a period of one hour or less, or a dosage of 100-300 mgs. per kilo. of body weight when administered by continuous contact with the bare skin for a period of twenty-four hours or less. The signal word "WARNING" would be required on economic poisons which offer hazards of a serious nature, but less dangerous than those requiring the "DANGER" mark. "CAUTION" was suggested for use on products less hazardous than those requiring the "WARNING" signal.

There were some objections to the four signal words used; among them was one that the application of the words should be based on the overall properties of the material. Among the suggested changes of wording was, that the phrase "significant number of deaths" was not specific and should be changed to "when death results in half of the tested laboratory animals"; and also that the change "toxic by inhalation, 200 mgs. per kilo of body weight" should be in the section covering "serious impairment of health." Comment was also made regarding what is meant by "any laboratory animal."

Strong opposition to requirements for specific coloring of white powder insecticides was offered. The blending of the white powders to a dirty gray by the use of carbon black was suggested as most practical from the safety angle. It was suggested also that the registrant's name be on the label instead of the terms, "Packed for . . . ," and "Distributed By . . . ," and that shipments of bulk chemicals, not going directly to the public but to processors and compounders, be exempt from the law. The forbidding of the use of trademarks or trade names for ingredients used was questioned and objections were raised against certain of the provisions regarding shipments of insecticidal material to be used for experimental purposes. Broader exemptions were felt necessary as well as a liberalization of the definition of economic poisons.

OUTLOOK FOR DDT

(*From Page 115*)

Control of forage crop insects will also add to the use of DDT. However, information on possible residue problems will have an important bearing on all out use of the material in this field.

The use of DDT in public health work such as "fly-free" campaigns, mosquito control projects and similar undertakings may appear to have been exploited to a limited extent, but very probably there will be a more fertile field in this direction as the advantages of this type of project become more appreciated. Interest in this field of use may be stimulated to greater height by the development of better application methods.

In summary, it appears that there is not as yet the market for DDT that current productive capacity is capable of turning out, and that curtailment of production is necessarily in the offing. However, there should be no room for pessisism on the part of manufacturers of DDT and DDT-based insecticides, but rather a feeling of optimism—with promised expansion of present uses and the search for even newer uses promising an expanded future market. It has often been pointed out that the entire insecticide market has been but partially explored and this again is true in the case of DDT. The manufacturers of DDT and DDT insecticides must launch a widespread educational and promotional campaign to increase the demand for the consumption of insecticides in general and DDT in particular.

All of this educational effort must be coupled with the stark realization by management that the "honeymoon" is over for DDT and production must be within reason. When the problem is approached in this fashion, the outlook need not be "dark".

Enjay Names Rathbone

W. V. Rathbone was recently named manager of alcohol and chemical sales by Enjay Co., New York marketers of chemicals made from petro-

leum. Mr. Rathbone, who was formerly assistant manager of alcohol and chemical sales, joined the Standard Oil Co. of New Jersey, with which Enjay is affiliated, a year after graduating from Lehigh University as a chemical engineer in 1926. From 1935 until 1941 he was technical assistant to G. W. Gordon, Standard Oil Co. (N. J.) and then he became assistant manufacturing coordinator of the chemical products of Stanco Distributors, Inc., now the Enjay Co.

Announces New Sanitizer

A new emulsifiable sanitation chemical, "Cifon," was recently announced by Fine Organics, Inc., New York. The new product is said to be compatible with soap and contains no caustic, free chlorine or carbolic acid. It is said to be a grease solvent in mode of action and selectively bactericidal to bacteria belonging to the colon group, such as *E. Coli* and *E. Typhi*. It is claimed to be particularly detrimental to organisms containing lipoids or waxes. Cifon attacks bacteria containing fats and waxes (such as the tubercle bacillus) by dissolving the fats and waxes therefrom and making the life process of the bacteria impossible. The new product is non-corrosive, non-inflammable but should not be used internally or on painted surfaces, asphalt, rubber, or linoleum. Cifon is recommended for use in chemical toilets, cess pools, and sewage sanitation, and as an insect repellent. In industrial plants, garages and machine shops it is useful as a grease remover and for slime control.

Study Germicidal Cleaners

Investigating the effectiveness of commercial surface-active agents for use as household cleansing agents, Massachusetts Agricultural Experiment Station, Amherst, Mass., examined some 42 commercial products. Germicidal power of about one-third of them was found to be high, according to the report of findings, while several others were rated only moderately effective. Experiments were then started to devise a procedure for evaluating these agents on a sliding scale, based on variations of time and concentration, preparatory to investigating the effect of organic matter, acids and alkalis on the germicidal power of the agents.

New R&H Bactericide

A new odorless bactericide "Hyamine 1622" was recently announced by Rohm & Haas Co., Philadelphia. The crystalline disinfectant, now being produced on a large commercial scale, is of the quaternary ammonium type and is claimed to be a powerful deodorizer. The new bactericide, in tablet form or packed in one-dose containers, can be used without special equipment. It is a white powder readily soluble in water, possessing very low toxicity to warm blooded animals. It is said to be effective against *streptococci* in concentrations as low as one part in 50,000, and to be stable, non-inflammable, non-corrosive, and non-irritating to the skin at proper concentration. The new bactericide is marketed under the trade names of "Hyamine 1622" and "Hyamine 10-X," both compounds being available as 100% active ingredients, and supplied by the manufacturer as raw materials for processing industries.

Consolidated Appoint Moore

Consolidated Chemical Co., Dallas, suppliers of floor finishes and sanitary chemicals, recently announced the appointment of John D. Moore as eastern sales manager for Missouri, Tennessee, Illinois, and Louisiana. The company also announced the opening of a sales office in Little Rock, Ark. This office and the Arkansas sales organization is being directed by Foster L. Crawford who formerly represented Consolidated in the west Texas district.

DDT for Japanese Beetles

Geigy Co., New York, recently released information on the control of Japanese beetles by the use of DDT. DDT insecticides of various types may be employed. Dusts to protect foliage or vegetation may be 3 to 5% concentration. Sprays may be applied using either water-dispersible powder, or one of the emulsifiable DDT products. While a water-dispersible preparation may be employed to treat soil, a dust mixture is ordinarily utilized. Irrespective of the type, one should attempt to have a dosage of about 20 pounds of actual DDT per acre. Application to soil surfaces may be made in the early spring, or early fall. This type of treatment is said to be particularly valuable for protecting valuable turf grass from the Japanese beetle.

Disinfectant Tests Approved

The Chemical Analysis Committee—Disinfectant Section, National Associaton of Insecticide and Disinfectant Mfrs., New York, recently circularized to its members two methods for testing quaternary ammonium compounds. The Hartley-Runnicles Method, set up by Dr. DuBois, was unanimously approved by the committee. The Gain-Lawrence Turbidimetric Method, set up by Dr. C. A. Lawrence, was tentatively approved for circularization in order that more information might be gained regarding its effectiveness. The former method is based on the qualitative alteration of the color of bromophenol blue from purple to pure blue by cations of high molecular weight, whereas the latter method involves the use of a protein substance which has been standardized to give a precipitate in the presence of quaternary ammonium compounds.

Benzene Hex. Plant Opens

A new manufacturing unit, expanding its production of benzene hexachloride, has been completed and put into operation by Pennsylvania Salt Mfg. Co., Philadelphia, at its Natrona, Pa., plant. This new unit is now producing benzene hexachloride with a strength of 33-36% gamma isomer.

Specialty Companies Merge

Excel Products Co. and Chemical Specialties Co. were reported in August to have merged. The new organization will continue under the corporate name of Chemical Corporation of Colorado, located at West 12th and Quivas St., Denver.

No Dividend for L. & F.

Directors of Lehn & Fink Products Corp., Bloomfield, N. J., took no dividend action on the capital stock normally due at this time, it was recently reported. The company paid 25 cents each in March and June, and in 1946, paid 35 cents in each quarter. The action was taken to conserve working capital pending better adjustments between prices and costs, the company said.

Skeen Joins Snell

John R. Skeen joined the staff of Foster D. Snell, Inc., consulting chemists and engineers, New York, September 1st as account executive in charge of market research. Dr. Skeen comes to the Snell organization from the staff of the Bureau of Internal Revenue. He is a graduate of Pennsylvania State College and received a Ph.D. from University of Pennsylvania in 1926.

Monsanto Opens in Phila.

Opening of a new office in Philadelphia by Monsanto Chemical Co., St. Louis, was recently announced by the company. The office will be located in the Widener Building and will handle all Monsanto sales with emphasis on organic, phosphate, and Merrimac division products.

Michigan Chemical Elects

C. S. Mott and Charles Wetherald of Flint, Mich., were recently elected to the board of directors of Michigan Chemical Corp., St. Louis, Mich. Mr. Mott is a director of General Motors Corp., and for many years was an officer in that company. Mr. Wetherald was formerly in charge of production at Chevrolet Motors. Recently retired from General Motors, he has now taken over active management of the U. S. Sugar Co.

Lowell Boosts Advertising

Due to expanded production facilities, the Lowell Mfg. Co., Chicago, and Lowell, Mich., makers of sprayers and dusters, will soon embark on a nation-wide advertising program. A dealer promotional campaign will be scheduled in some twenty trade journals and a comprehensive dealer-help program is now under way. John W. Shaw, Advertising, Inc., has been named as advertising agency for Lowell.

New Fumigation Applicator

A small space fumigation applicator, which punctures from one to twelve one-pound cans of methyl bromide fumigant simultaneously, was placed on the market in August by J. Carl Dawson & Associates, St. Louis. With the multiple applicator enough methyl bromide is available at one time to fumigate the average railway box car, cold storage vault, truck trailer or river barge section. It can also be used for under tarpaulin fumigations.

Cans of methyl bromide are placed on a rack on the applicator and are held down by a locking clamp bar. After releasing a safety catch, one steps down on a lever which causes the cans to be punctured and the holes immediately gasketed so that the gas flows from the cans into connected tubing and through a valved plastic tube into the space to be fumigated.

NSSA Meets in Detroit

The Central Regional Meeting of the National Sanitary Supply Association, Chicago, was held at the Hotel Fort Shelby, Detroit, on September 11th and 12th, 1947. Chairman of the meeting committee was S. J. Bockstanz, Bockstanz Bros. Co., Detroit.

Westvaco Names Riley

Walter J. Riley was recently named divisional sales manager in charge of the technical sales division, Westvaco Chlorine Products Corp., New York. Associated with Westvaco in various technical and research activities since 1936, Mr. Riley was most recently assistant to the technical director at New York.

Givaudan Appoints Wallace

William H. Wallace, president of Stuart Brothers Co., Ltd., Montreal, and distributors in Canada for the products of Givaudan-Delawanna, Inc., Delawanna, N. J., and L. Givaudan & Cie, Geneva, Switzerland, was recently appointed vice-president of Givaudan-Canada, Ltd.

Quotes from Our Readers

We take pleasure in quoting from a recent letter by E. J. Capstack, industrial sanitation research department, Joseph E. Seagram & Sons, Inc., Louisville, on the subject of the article on floor soaps by Milton Lesser in the July issue of *Soap & Sanitary Chemicals*. Mr. Capstack's letter sheds considerable light on the subject of floor soaps as they might be used on rubber surfaces. Said Mr. Capstack, "We have conducted numerous studies comparing the effect of soap and alkaline detergents and have found from practical experience that soap is not detrimental to rubber floors if the surface is well rinsed after washing. In the laboratory, it can be shown that soap will soften rubber. On the other hand, alkaline cleaners have a tendency to harden such floors and affect the surface so that a gloss is difficult to obtain.

"The largest factor which has influenced us in using soap for cleaning our soft floors is that frequently, rubber floors are laid adjacent to linoleum or linotile floors, which are definitely affected by alkaline cleaners. We do not consider it practical to change cleaning solutions from office to office and have adopted the practice of cleaning such floors with a quality soap coupled with careful rinsing. "We cannot over-emphasize the need for thorough rinsing as we regard this operation equally as important as applying the cleaning solution itself.

"We have always looked upon sanitation as an integral part of plant operations and have recognized the importance of training sanitation personnel through classroom lectures and on-the-job instruction to follow correct cleaning procedures. Using trained sanitors, under competent supervision, we have found our procedure for cleaning rubber floors with soap to be quite satisfactory in our plants. Many of these rubber floors have been cleaned at a frequency as high as every two weeks to monthly over a period of several years and are still in excellent condition and giving good service."

INDEX TO ADVERTISERS

*For further details see announcement in 1947 SOAP BLUE BOOK

Every effort is made to keep this index free of errors, but no responsibility is assumed for any omissions.

Tale Ends

ABOUT a year ago, we took a sly crack at one of Essential Chemical Co. products, says Jim Wheeler, prez of that firm. The Milwaukee soap baron now calls us on the alleged insult, saying we poked fun at his pet product, "Fun," because it was sold in wooden buckets at $5.50 per each. He adds that our aspersions were unwarranted and that he has paid more than that for a "pint of fun." My gosh, wonder what he drinks!

* * *

Stand back! Give us air! We are being overtaken by a rash of poetry sent to us by soapers. From G.E.S. Georges of Petrolia, Canada, comes a long opus which would fill two pages. When we showed it to the head editor, he gave us one of his medium tough sneers and said: "What the hell kind of a mag do you think we are running? Poetry! Bah!" So the following, from another poet-at-the-kettle we are crowding in here just to show that even a soaper may have tender thoughts now and then.

Said the SOD to the bar of soap,
With Ca and Mg, you ne'er could cope.
Your time has come, the end of your rope.
The market's mine,—I hope, I hope!

Said the chastened soap to the SOD,
That may be so, but time will see
I may have trouble with Ca and Mg,
But I ain't done yet, you SOB!

Edgar Allen McPoe

* * *

Main theme for the 1947 National Pest Control convention in October at Philadelphia. . . "what do we do when DDT puts us all out of biz and there ain't no more bugs to kill?" Nice cheeerful view the boys take of their future!

* * *

Mel Fuld, one of the Fuld boys of Baltimore, is reported already biting his nails to the elbow worrying over speakers for the 34th annual NAIDM meeting in December in that fair city. They stuck Mel with the program chairmanship.